A Profitable Year in 1925

THESE are the final days of a wonderful year. There may be some doubt in some minds over one word used in the above statement. There even may be some arguments developed in some quarters as to whether 1924 was "a wonderful year" or not.

But to the man who has gone down into and through the year like the men who go down to the sea in ships, the man who has thought and fought through the problems which this year has presented, it is a wonder year.

There has been a big kick in his experiences. There has been real growth and progress upward and outward, a constructive expansiveness, which only a year pregnant with such problems could present.

To the business man who reckons this year as an asset among the years he has spent, there comes in these closing days a joy and a sense of thankfulness that he would not be without.

In the first place, he's glad the year is closing. It has been a year of intense competition. But that has not done him any harm. He has had to draw his sword and measure his blade and match his skill with every other member of his klan and kind in his particular line of endeavor. He has come, in these days, to the end of the prolonged fight, possessed of a knowledge and conviction that after all is said and done, he is a bigger, stronger business man than he was when the year began.

He knows that he has fought through and won clean and that his victory means his certain survival. That's worth a heap. He couldn't buy it; he had to try it. He did and he won it. It's his.

Business is bigger and broader and better. He entered 1924 uncertain as to the outcome; he finishes the year certain as to the outcome of 1925. Why?

Because business emerges from the intense competitive battle of 1924 stabilized. Every industrial and commercial factor is stabilized, particularly labor, which constitutes 75% of the total cost of all commodities. With three-quarters of the total commodity cost absolutely on a firm, impregnable and demonstrated basis, and the remaining quarter, capital account or factor, having taken its maximum demonstrated shrinkage during the past 13 months, there is no uncertain element left to cast any doubt on the future progress of the coming activities.

With uncertainty eliminated and confidence restored, who and what can hinder the program which every red-blooded business executive has determined upon—that of "full steam ahead"?

And speaking of thankful favoring factors—look them over:

1—The foundation of the Dawes' Plan in March last for the Reconstruction of Europe.

2—The acceptance of the Dawes Plan by the Germans, French, Belgians and English.

3—The return of prosperity to the agricultural classes in America, through the production of big crops at constantly increased revenue to the farmers.

4—The splendid successful loan of two hundred millions of gold dollars to Germany for the establishment of a sound money basis in that country.

5—The election of Coolidge and Dawes, the overwhelming defeat of the La Follette menace and the certain abolition of business, sand-bagging by partisan, senatorial committees for partisan political purposes only.

6—The loan of one hundred million dollars to France.

7—The practical under-writing of the Dawes Plan as shown by the recent favorable German elections.

8—The continued increasing exports of American products as shown by the following table:

July exports	$278,000,000	September exports	$427,000,000
August exports	330,000,000	October exports	527,000,000

These are but the eight main national and international factors of outstanding pre-eminence. The United States, by competing intensively among its own industrial processes, won a victory also and brought the whole industrial and commercial system into condition to enter world competition and fit for fighting.

All these are factors of favor and thankfulness. Where is the business man whose heart does not glow with a finer sense of enthusiasm and quest for the coming of 1925? Where is the business man who does not recognize that in order to conquer in 1925, we must of necessity have had these months of intense preparation in 1924?

Good-bye, old 1924. You've been a memorable year, a wonderful year—a forerunner for the Profitable Year of 1925.

MORSE SILENT CHAIN DRIVES

Morse Silent Chains driving beaters in a well-known bag and paper company

Getting the most power out of your motors

MORSE SILENT CHAIN DRIVES are doing their share in keeping production in hundreds of paper mills up to top-notch efficiency. They transmit 98.6% of the horse-power developed by the motor—they deliver this power continuously, with a sustained efficiency year in and year out. No increasing loss of power as with gearing which wears with age, no loss of power or production as with a slipping belt.

The Morse Silent Chain is a high speed, flexible positive drive, quiet in operation at all speeds, convenient in application, using short or long centers as most convenient. It has long life, and low up-keep cost.

Let Morse Engineers help you plan an efficient drive for your own plant.

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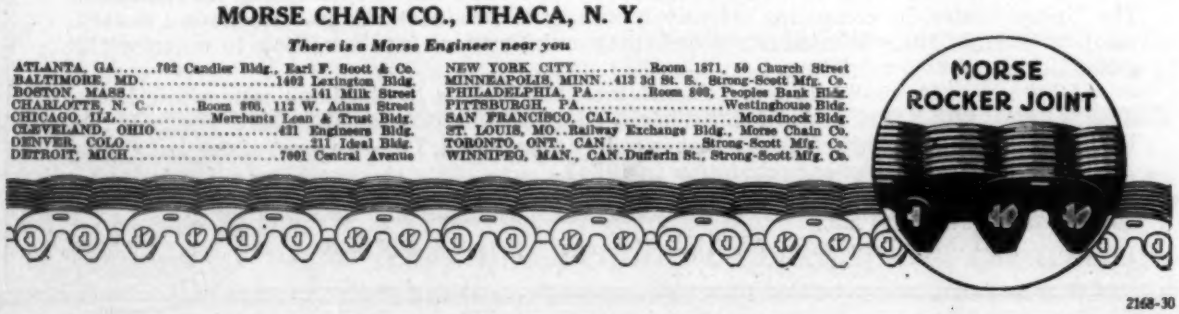
BOSTON, MASS.....141 Milk Street
CHARLOTTE, N. C.....Room 806, 112 W. Adams Street
CHICAGO, ILL.....Merchants Loan & Trust Bldg.
CLEVELAND, OHIO.....431 Engineers Bldg.
DENVER, COLO.....211 Ideal Bldg.
DETROIT, MICH.....7001 Central Avenue
NEW YORK CITY.....Room 1871, 50 Church Street
MINNEAPOLIS, MINN..413 3d St. S., Strong-Scott Mfg. Co.
PHILADELPHIA, PA.....Room 802, Peoples Bank Bldg.
PITTSBURGH, PA.....Westinghouse Bldg.
SAN FRANCISCO, CAL.....Monadnock Bldg.
ST. LOUIS, MO..Railway Exchange Bldg., Morse Chain Co.
TORONTO, ONT., CAN.....Strong-Scott Mfg. Co.
WINNIPEG, MAN., CAN.Dufferin St., Strong-Scott Mfg. Co.



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EDITORIALS

Up-to-date Progress in Safety

THERE is probably no factor in the productive organization of paper making greater than that of Safety, the preservation of life and limb which enables industry to secure intact the continuous and normal service of labor. We can talk indefinitely about the material progress made in industry—the perfection of mechanical and chemical processes which have effected wonderful economies and promise infinite more—yet the safe and contented worker is the most essential thing for our industrial progress.

Organized safety effort in the pulp and paper industry has been going on for about 9 years. Participation has grown from about 36 companies in 1915 to more than 180 in 1924. There is scarcely a big pulp or paper mill in the United States but what is now actively conducting Safety campaigns in their respective mills.

The indication of the progress being made in Safety is shown in the statement by one of the largest pulp and paper mills in the state participating in this movement. The Kimberly-Clark Company, of Neenah, Wisconsin, state that in 1917 with 1,754 employees, they had 284 injuries causing a loss of 3,582 days. In 1923, with 2,573 men, they had 98 cases causing a loss of 2,785 working days. In 1924, the first eight months and twenty-seven days have shown 45 injuries, causing a loss of 1,343 working days—this with the total employed force of substantially the same number as in 1923. Should this ratio hold until the end of 1924, it will be at the rate of 60 accidents, causing a loss of 1,791 working days. Reducing this to a comparison of 1917 to 1924 in the terms of days lost per year per man, 2.6 days per man were lost in 1917 as compared to less than .7 days per man in 1924, or a reduction of more than 70% in time lost on account of accidents.

Another large participant in the Safety Movement, The Nekoosa-Edwards Paper Company, Port Edwards, Wisconsin, report that in 1914 there were over 200 accidents in their company, but that in the first nine months of 1924, there were but 25—this being a cut of 75% over last year's record.

Testifying to the regard in which the question of Safety is held in the Hammermill Paper Company, Erie, Pennsylvania, another of the large participants in the movement, President Ernst R. Behrend, states:

"From the very beginning of the Hammermill Paper Company, Safety has been considered of primary importance. The question of safety in its broadest sense, of the health and lives of our employees, has always taken priority over financial consideration.

"Whenever accidents have occurred, and unfortunately there have been some, we have earnestly endeavored to analyze them thoroughly, to draw our lessons for the future and to prevent similar occurrences. In the earlier years of our business existence, we followed this policy, regardless of the question raised in those days by the liability insurance companies, that in safeguarding places where injuries had occurred, we might be admitting liability before the law."

The foregoing should prove conclusively that organized safety effort is a highly economical investment and should be made by every pulp and paper mill in America.

Elimination of National Waste

"ELIMINATION of National Waste" is the keynote of Secretary Hoover's annual report. Under this head Mr. Hoover reviews the accomplishments of the Department during the first three years of the present administration, notably in the fields of unemployment, seasonal construction, coal, superpower, standardization, simplified practice, co-operative marketing, and the reduction of housing costs. Trade association activities are discussed from the same angle.

"Wastes are legion," says Mr. Hoover. "We have the highest ingenuity and efficiency in the operation of our industry and commerce of any nation in the world. Yet our economic machine is far from perfect."

Through the offices of the American Paper and Pulp Association and its co-operation with the Government, the paper industry has made notable progress in the past year. Its participation in the passing of the Clarke-McNary Act which granted relief to the forestry situation, and the putting into effect the simplified practice of manufacturing certain standards of papers, have been examples of alertness shown by this industry. Many important policies are included in the program for 1925, and with the outlook of sane government ahead, we should be encouraged to push hard on the issues in hand.

The Christmas Tree

IT is said that probably $5,000,000 will be expended for Christmas trees this year. Perhaps ten million trees will be used in the United States.

While we hesitate to be included with those who would be satisfied to see the old fashioned Christmas tree descend into history and welcome the introduction of the artificial, we regret the ruthless mutilation of forest trees, 20 to 50 years old, for Christmas consumption, and especially the desecration of the landscape by cutting trees that have been planted for ornamental purposes.

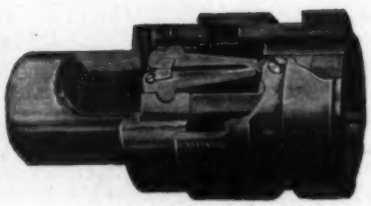
It has been demonstrated that Christmas tree raising can be made a profitable business, and development along this line is favored by foresters. Let us not, therefore, practice forest devastation for our Christmas celebrating.

The PAPER INDUSTRY extends to all of its readers and advertisers its heartiest wishes for a Merry Christmas, and the sincere hope that the New Year will be filled with prosperity and achievement.

THE JOHNSON FRICTION CLUTCH

as used in the Shake-head of a very

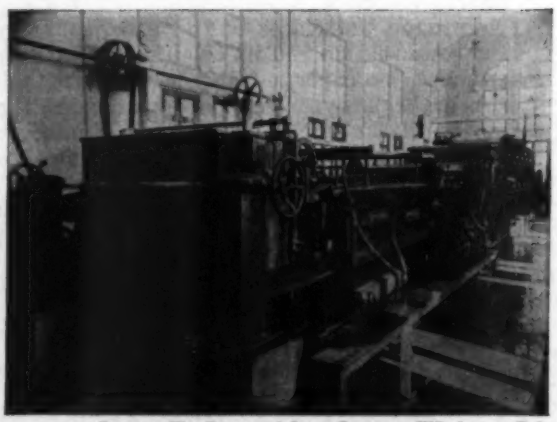
Small Fourdrinier Paper Making Machine



Single Clutch—Sectioned

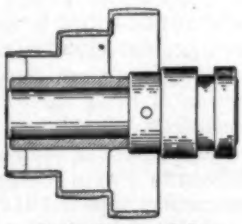
WAY off on the other side of the world the sturdy Johnson Friction Clutch whirs busily daily at its task. In far-distant Siam, on a small government-owned Fourdrinier Paper-Making Machine, a No. 2 Single Johnson Clutch does its work faithfully and well.

Built into the shake-head is a loose cone, with Johnson Clutch for starting and stopping the shake-head.



Courtesy The Pusey and Jones Company, Wilmington, Del.

Interior view of government owned paper mill in Siam, showing Fourdrinier paper machine



Single Clutch with Cone Pulley on Hub

FROM Bangkok, the capital of Siam, come excellent reports of the work of this Johnson Clutch. The fine reports came to Pusey & Jones, of Wilmington, Del., who built this Fourdrinier for the Siamese government in 1923. So that firm promptly ordered another Johnson for another Fourdrinier for the Kimberly Clark mills at Neenah, Wis. Install Johnson Clutches on your paper machines. Full data free. Write us.

Write for Catalog "G"

THE CARLYLE JOHNSON MACHINE CO. MANCHESTER CONN

THE PAPER INDUSTRY

REG. U. S. PAT. OFF.

Vol. 6 DECEMBER, 1924 No. 9

Steam Accumulators

Their Principle and Importance to Heat-Using Industries

By ALFRED J. T. TAYLOR, A.S.M.E.

President, Combustion Engineering Corporation, Ltd., Toronto

WIDELY fluctuating loads in a boiler plant do more to adversely affect economy than possibly any single influence. In this country very few exact investigations have been made of the influence that the variations in the rate of production and consumption of steam or power exercise on the working methods and the overall efficiency obtained in our industrial plants. On the contrary, the heat balances of such plants have invariably been set down, as if the source of energy to be used on the one hand, and the consumers of energy on the other, were delivering and absorbing energy at a constant rate without any variations. In practice those variations have been accepted as unavoidable, and attempts have been made to counteract their effects by forcing the boilers, which causes considerable losses, owing to the fact that the supply of heat on the one hand and the consumption of steam or power on the other are by no means equivalent in quantity or coincident in time.

The author of this article was recently appointed to conduct an extensive investigation throughout the pulp and paper industry of Sweden and Finland with special reference to the economical use of steam. This article deals with the result of his study there of the Ruths Accumulator, which is at present the subject of much interest in the mills on this continent.

There is a principle of storing steam in water under increasing pressure and discharging it under falling pressure that provides an excellent means for avoiding the evil effects of fluctuating demands for steam, and virtually places the consumers of energy or heat independent of the rate of suppl yfrom the boiler.

The Ruths Steam Accumulator was invented by Dr. Johannes Ruths of Sweden and has been widely adopted in the Scandinavian countries and also on the Continent to the great benefit of many industries, and when it is known that there are in excess of seventy accumulators in the pulp and paper industry in these countries alone, it becomes of immediate importance to us in the English speaking world.

The accumulation of steam in water and its subsequent evaporation is a well-known principle and has for a long time past been used by practical engineers; in this connection reference may be made, for instance, to the Rateau accumulators and also the feed water accumulators by Druitt Halpin and others. The direct storage of steam **without** water has also been effected in practice both in containers of constant volume and in containers of variable volume.

In all cases just mentioned, however, with the exception of the feed water storage systems, the definite aim in view is that of accumulating the exhaust steam of hoisting engines, or rolling-mill engines, etc., where the work proceeds intermittently, so as to make it possible to pass the exhaust steam from these engines into continuously working low pressure turbines, even during the intervals when the main engines are at rest.

Every steam boiler of very large water content could in principle be arranged as an accumulator, but in order that the boiler may act as an equalizer, it must be constructed for a pressure above the normal working pressure, so that variations between the maximum and the normal working pressure may be obtained. The fact that no such increased pressure has been provided for, but that, on the contrary, the boilers are usually constructed for a pressure only so much higher than the steam pressure needed, as corresponds to the pressure drop in the pipe lines, proves that the principle referred to has never been carried through completely in practice.

Instead of aiming at accumulation by permitting

variations of pressure, efforts were and are still, on the contrary, directed towards keeping the pressure as constant as possible. It is usually considered as evidence of good working, if the boiler pressure diagrams approximate as closely as possible to straight lines.

As, with constant boiler pressure, no accumulator action is possible, it follows that the quantity of heat conveyed from the fire to the heating surface per unit of time must likewise exactly correspond to the amount of steam that the boiler is required to supply. It is therefore evident that the variations in the steam demand must cause corresponding variations in the fuel supply to the boiler.

The only correct solution of the problem of rational steam utilization, is to employ the steam boiler exclusively as the steam generating agent, working at a constant load, and to dispense entirely with the use of the boiler as an accumulator. Accordingly, the steam generator may be built with very small water space, or even with none at all—in the latest constructions the steam generator is practically speaking,

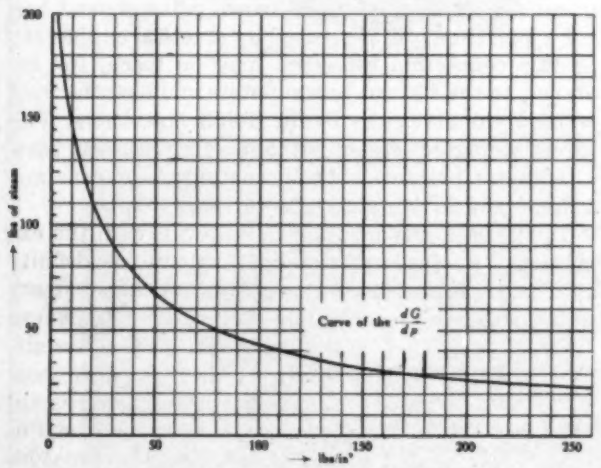


Fig. 1—The amount of steam "G" produced by 100 ft.³ of water through a drop of pressure of 10 lbs./in.² for various steam pressures p.

simply a coiled pipe—and should be worked at an absolutely constant high pressure. Instead of every common type of boiler, at present having its own water tank, which consequently must be built to stand the full boiler pressure, the water spaces of all the individual boilers should be, so to say, united into one tank, entirely separated from the boilers and well insulated against loss of heat. In such tanks, usually built for pressures lower than those of the boilers, a much larger variation of pressure is attainable than in the boilers. Furthermore, these tanks can be built of any size whatever, irrespective of the type of boilers used or of the size of their heating surface. In order to illustrate the importance and scope of this idea, an analogy from a different invention may be cited. The writer refers to the well known success that was obtained by Ilgner in the equalization of load and supply in power plants by separating the energy storing flywheel from the main engine and driving the former by a separate engine. In this way, Ilgner succeeded in overcoming great variations of short duration in the rate of power consumption of certain types of machinery, such as rolling mills, hoisting plants in mines, etc., which variations had not previously been possible to overcome by the use of flywheels arranged in the usual way.

This same principle has been applied by Dr. Ruths to the production and use of steam and he has thereby succeeded in eliminating all variations in the rate of supply as well as in the consumption of steam. In the same way as Ilgner separated the flywheel from the main engine, Dr. Ruths has separated the water space from the boiler and has a separate container, in which the steam is accumulated or stored under pressure. By this means the mass of accumulating water working in the steam system representing a large "flywheel effect" can be increased to any desired extent. As it is not necessary that the accumulator should be built to stand the high pressure of the boilers, full use can be made of the property of hot water to accumulate much more steam at low than at high pressure for a given pressure drop.

The importance of this may be clearly seen from Figure 1, in which the amount of steam produced per unit of volume (1 m³ or 100 cub. ft.) of boiling water for a certain pressure drop (1 kg/cm² or 10 lbs. per sq. in.) is shown for various steam pressures. It must also be observed that the accumulator, when separated from the boiler can be so arranged that a very much greater pressure-range may be permitted in it than is possible in a boiler.

Dr. Ruths, when he approached the subject of steam accumulation, did not confine himself merely to the saving of exhaust steam, as Rateau and other engineers have done, but set himself the problem of overhauling the entire heat and power economy of industry, from the point of view of the accumulation of steam in water.

A survey of the literature on this subject shows that the conditions affecting this general question have not been fully recognized earlier, so that there was not only the task of solving the problem to be done, but first of all to work out a clear and definite formulation of it. That this was necessary is conclusively proved by the fact that the number of cases is very small in which the variation of energy, especially heat energy, in the various branches of industry have been systematically studied.

In researches extending over many years in a great variety of industries, the author has executed a large number of measurements of the rate of steam consumption. Out of the results of that work the problem of **general** steam accumulation was formulated and its subsequent solution evolved.

The Ruths Accumulator

The Ruths accumulators are built in the form of cylindrical steel tanks with hemispherical ends, being the safest and in other respects most favorable form. They are filled with water up to 90-95 per cent of their capacity. Figure 2 shows a sectional view of an accumulator. (B) is the vessel constructed of riveted steel plates. (I) is a covering of non-conducting material, usually consisting of up to 4 inches of infusorial earth (kieselguhr) or infusorial earth mixed with cork, or of a magnesia composition. (J-K) are insulation blocks covering the riveted seams of the shell. They are made removable, so as to enable the inspection of the seams, to be readily carried out. The lagging is protected by a sheet iron cover (E).

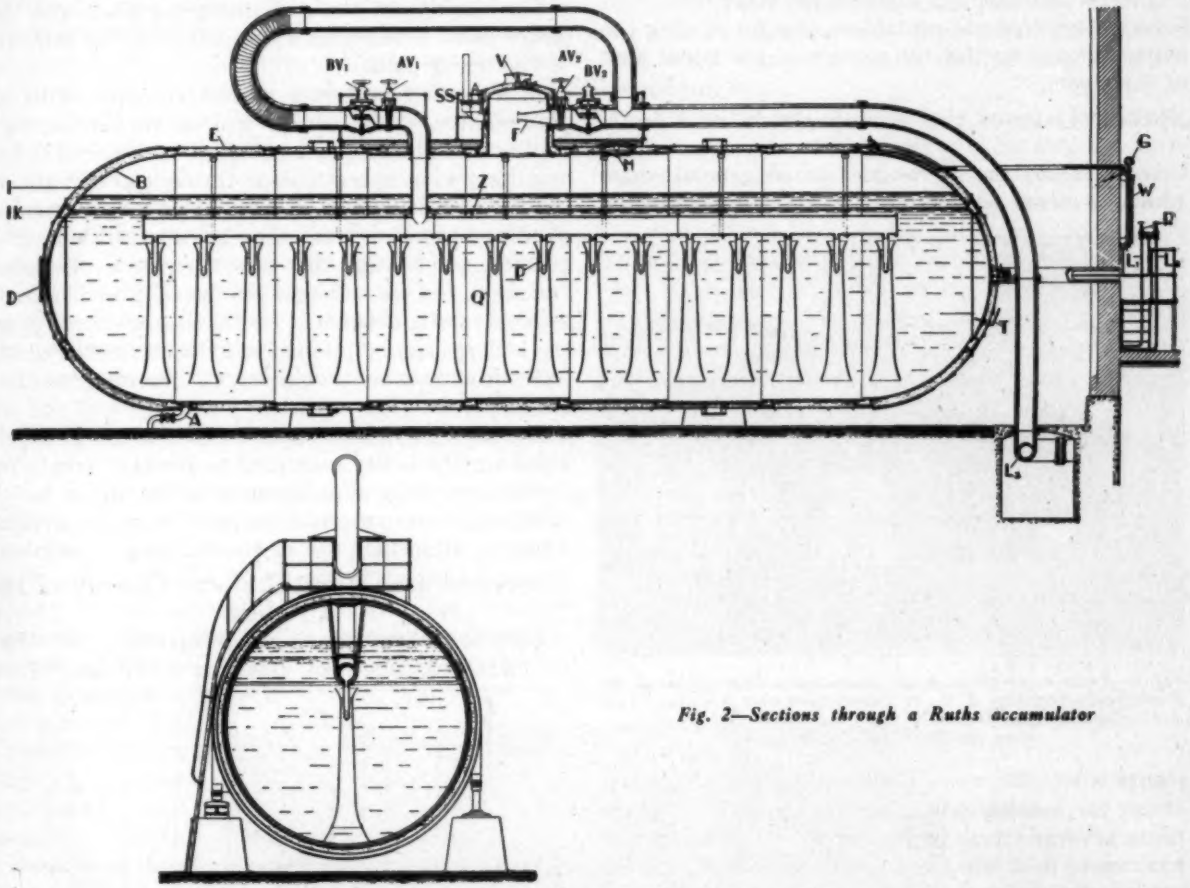


Fig. 2—Sections through a Ruths accumulator

The accumulators are equipped with the fittings usual in boiler practice and further with arrangements for the charging and discharging of the steam, two non-return valves (BV_1) and (BV_2). (BV_1) admits charging steam to the internal steam distribution pipe (Z) and the charging nozzles (P) which are equipped with the circulation pipes (Q) to insure a uniform heating of the water. Through valve (BV_2) the discharge of steam takes place. Figure 3 shows a typical installation.

Heat Losses of the Accumulator

The heat losses of the accumulators are considerably less than is generally imagined, and as a matter of fact so small, that they are of no practical consequence. Results of insulation tests made on accumulators in practice show that with the thickness generally adopted the heat losses only correspond to from 0.1 to 0.5 per cent of the coal consumption of the boilers, and are therefore of no practical importance. That being so, the accumulators are usually erected in the open air, and often at some distance from the boiler-house, in factory yards, etc.

Accumulator for Superheated Steam

From the description above it is evident that the accumulator described above, although it can be charged with superheated as well as with saturated steam, can only deliver saturated steam.

In certain cases, however, it is desirable to have an accumulator that can also deliver superheated steam. This is of great value especially in plants where the accumulator has to feed such consumers as steam engines, steam turbines, steam hammers, etc., which utilizes the energy of steam for the production of motive power.

The possibility of feeding such consumers with su-

perheated steam means a considerably lower steam consumption and hence also a reduction in the accumulator capacity needed. This problem has been solved by adding to the steam accumulator a second container, so designed that it works on the same principle as the well-known Siemens regenerative heater used in connection with metallurgical furnaces for preheating the gas and the air of combustion.

The accumulator for **superheated steam** thus consists of two separate containers, one for storing the **superheat** and one for the storage of the **latent heat** of the steam.

Special Uses of the Accumulator in Power Plants

Apart from the above mentioned general value which a steam accumulator has in the numerous

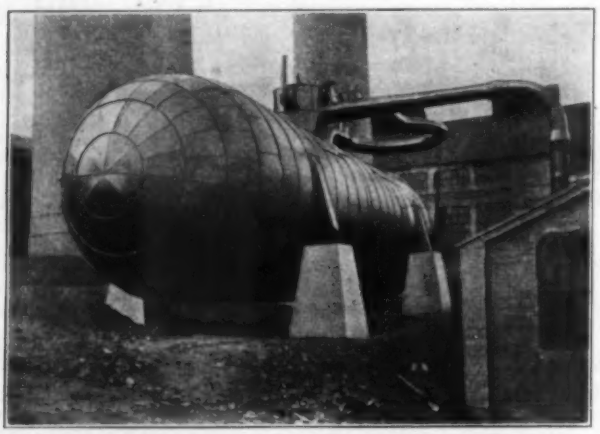


Fig. 3—Ruths accumulator in the Kvarnsveden Paper Mills of the Stora Kopparbergslags A. B., at Kvarnsveden near Borlange (Sweden). Capacity 6,350 ft., length 51.5 ft., diameter 13.1 ft., accumulating capacity 17,600 lbs. of steam

plants where there are variations in the demand of steam for heating or for power purposes, or where there are variations in the supply of heat (surplus gas, waste heat, etc.) the accumulator can with advantage be used in connection with power transmission systems, e. g., those utilizing water power.

The combination of a steam accumulator with one or more steam turbines is a very useful means of maintaining a local stand-by working with very small no-load costs and other working expenses. Even in cases of sudden interruptions in the supply of current from long-distance power transmission systems the local load can, if required, be taken over without any delay by a steam turbo-generator, fed by the accumulator, without the necessity of keeping the boilers permanently under steam. The steam accumulator will in such cases take the place of lead batteries. Further, in the "heavy" industries such as in iron and steel works, where a co-equalization has to be maintained between the variation in the supply of energy (surplus gas from blast furnaces and coke ovens, waste heat from furnaces and engines) and the fluctuations in the consumption of energy for power purposes, the steam accumulator is of greater commercial and technical value, than, say, the expensive Ilgner type plants and the storing of the low grade blast furnace gas in gasometers. It is interesting to note in the latter connection that one pound of steam which when stored in a steam accumulator, occupies .02 of a cubic foot, corresponds in thermal value to about 16 cubic feet of blast furnace gas.

Results Obtained in Practice

The working of the manufacturing plant and the power plant is rendered independent of the working of the boiler plant.

In a factory or power station equipped with an accumulator, steam can at will be supplied at **any** time at an **unlimited** rate should it be required in the manufacturing operations or through peak loads in the power distribution system. The manufacturing plant and machinery can thus be fully utilized. For example, a heating process normally consuming steam at the rate shown by Curve 1 in Figure 4 (which rate is dependent on the steam supply from the boilers) can be intensified by accumulated steam to the high rate shown by Curve 2, whereby the time T-t is saved.

By having a steam supply which is unrestricted, although the boiler load may be constant, costs for installing or extending manufacturing apparatus or boiler plant are materially reduced or wholly avoided by more intensified use of the existing installation.

Improved and More Uniform Quality of the Product

Lack of steam often occurs in factories just when an increased supply of steam is badly needed for

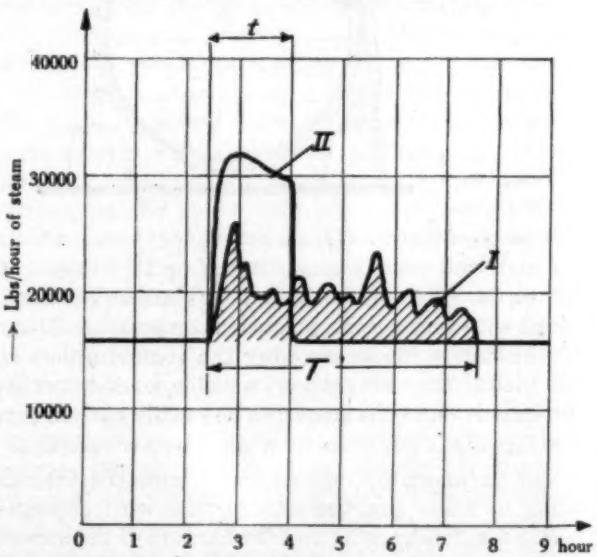


Fig. 4—Reduction in time required to get up steam in a factory after installation of a Ruths accumulator. Curve I: "Creeping" steam diagram before installation of accumulator. Curve II: The same diagram with accumulator

carrying through a manufacturing process. The process is then delayed or the quality of the product lowered.

It must be borne in mind that as a rule, of two

operations proceeding simultaneously, the cruder process, such as "heating-up," etc., will generally use steam to the detriment of the more refined operations, like drying or chemical processes. By impediments of this kind, the conduct of the manufacture, from the point of view of obtaining high quality, is rendered very much more difficult, and, as a matter of fact, irregularities of this nature in the steam supply to the individual apparatus are frequently the cause of the production of so-called "second-class qualities." By the adoption of the accumulator, the different processes can be conducted quite independently of one another, without any mutual interference whatever, and with something like laboratory exactitude.

By the action of a steam accumulator the peak-loads are taken off the boilers and their pressure kept constant. Fires can be closely adjusted to give the most favorable combustion of the fuel. Great fuel economy results, together with more even working and less wear and tear.

The accumulator furnishes the possibility of keeping the boiler pressure constant, and just below the blow-off pressure of the safety valves, which fact has a very favorable influence on the output of back-pressure turbines or engines.

Moreover, the output of the high pressure stage of an extraction turbine or of a simple back pressure turbine is materially increased by the equalizing influence of the accumulator, as with the constant steam flow from the boilers through the turbine, very small losses occur in potential energy of the steam by throttling. If a back-pressure extraction - power system does not comprise an accumulator and the fluctuating steam flow to the consumers is as usual led through the back-pressure turbine or the high - pressure stage of the extraction turbine, it must be run at a variable load and consequently great throttling losses result.

The action of the accumulator effects a further gain in the output of such a turbine from the fact that, despite all the variations in the steam demand, practically all the steam produced by the boilers is conveyed through the turbine. It very often occurs in such plants when not provided with an accumulator, that large quantities of heating-steam have to be by-passed direct from the boilers without power generation, as it is usually not of advantage economically to make the turbine of such a size that it can pass the maximum demands of heating-steam which occur, for instance, only when digesters are started, drying vats are heated up, etc.

Even in the case of a steam power plant, from which no steam is abstracted or exhausted for heating purposes, as for instance in an ordinary power station, there is no loss of power by the insection of an accumulator (eventually arranged for superheated steam) between two turbine stages.

As the boiler pressure as well as the super-heat are automatically kept at their maximum values by the accumulator and as, further, the efficiency of the high pressure stage is practically constant, though the accumulator pressure varies and as also the low-pressure stage—especially if it is equipped with automatic nozzle control—utilizes the steam from the accumulator without extra losses, the total heat drop available is not less with an accumulator introduced between two turbine stages than it would be without it. At most, the heat drop is reduced by an amount corresponding to the extra back pressure caused by the water-head above the nozzles in the accumulator. This head, however, is small, so that the loss entailed is of no practical importance.

There is, in the writer's opinion, no single advance in steam generation during the past ten years that means so much to the heat using industries as the Ruths Accumulator; its principal value lies in the possibilities it gives of greater quantity and better quality of production and the influence it has on the working of the factory considered as a whole.

The Kent grinder flange consists of a threaded hub of bronze or steel with a large square shoulder over which fits the flange proper. The shoulder of the hub and the recess in the flange are machined to a close fit, and the ensemble is fully as strong as the one-piece steel flange or the steel flange with a bronze bushing threaded to it. The value of this flange lies in the fact that if the threads of the hub become broken, or if the hub itself breaks, the only part discarded is the hub. The old flange may be used again with a new hub.

Employee Betterment Plan for the Small Paper Mill

By H. S. SWEETER

A CONSIDERABLE number of the smaller paper mills throughout the United States recently added limited employee betterment units, following the lead of the bigger mills, especially those in the Holyoke district. These limited undertakings show some degree of success, and it is felt that they can be made of great benefit after a longer period of experience with them has been attained.

The writer recently made a survey of this question for one of the leaders in the paper industry and uncovered some interesting and valuable facts for the operator who hesitates at undertaking any such plan even on a limited scale.

On the other hand, probably the leaders in no industry have gone further in employee welfare activities than our larger paper mills. The consensus of opinion is that they have vastly reduced labor turnover and have thus insured an even break if not a real profit, though subsidies have been very heavy in many cases.

Of course the beginning of the modern employee betterment movement was in the employees' mutual benefit society, but this co-operative method of welfare work didn't go far enough. Not until the leaders in the mills stepped in with management and administration, as well as initial financial backing, did the betterment units begin to show a profit on the investment of time and money.

It is certain that if welfare work didn't pay, so many of our paper mills would not continue their operation and steadily improve their facilities and resources. This fact alone should make the subject worth the study of the smaller mill operator.

Two chief ends are sought in organizing an employee welfare unit in the trade: I—Protection of the employee—socially, physically. II—Benefit—financially, recreationally.

The original efforts, co-operatively of employees to unite in their own interests in a single plant, looked to insurance benefits, sick benefits and more or less slipshod recreation, usually not of a beneficial character.

Benefit and protection as backed by the leaders in the mills go a great deal further in fostering friendliness, co-operation, study, physical welfare and beneficial recreation including athletics, the facilities for which require considerable expenditure.

With Limited Facilities

Let us take a place employing 300 employees. The mutual benefit society, if there is one, need not interfere with any systematic work that the employer may care to do in addition. The society may go on functioning with its insurance benefits just the same; but this society may easily form the basis for a self-governing betterment department insofar as control is concerned.

But the management, if it is to be effective, practically demands the attention of a man or woman who understands the subject of betterment administration. It is not practical for employee officered societies to have a clear understanding of the various branches of welfare work nor the time to administer them properly.

One employer I checked up on has 350 workers. They have had a mutual benefit society five years. Once a year they hold a dance and now and then some other form of entertainment, with base ball in season in the local industrial league.

Last year a trained welfare worker was employed at fifty dollars a week. A meeting of the employees voted half of the society's surplus of $10,000 toward extension of recreational and welfare work in the plant. The employer gave $5,000 to match it. Here was $10,000 capital to begin on. Every member employee now gets the following benefits, free: a—Semi-annual dental examination; b—Semi-annual physical examination; c—Friday moving pictures from October to April; d—Handball court; e—Tennis court; f—Free hot coffee for lunch hour; g—Sitting and reading room with 100 books and 15 current magazines.

The original $10,000 capital was invested as follows: $1,000 for construction of handball court; $1,000 for moving picture projector and screen, with chairs for audiences. Seven hundred dollars for coffee urns and china service; $1,000 for tennis court; $2,500 for dental and physical service; $1,000 for rest or sitting room furniture and library. The balance, $2,800 goes for supplies, maintenance and to the salary of the director.

This covers the first year of operation. The policy of the firm is to match every dollar put up by the employees' society with another dollar to be devoted to the maintenance of the welfare department.

A budget system was arranged for 1924, but as the heaviest investments have been made, the taxation for employer and employee will be proportionately less.

It has been the policy of a large number of firms in the trade to add first those welfare departments

which serve, such as medical attention, dental examinations and first aid outfits. A trained nurse who can also direct other welfare work is preferred.

Apparently the best way is to begin with a rest room or recreation room, followed by the addition of a miniature hospital and first aid. Of course, every firm today has first aid in some form or other. But the possibilities for service in this respect can be broadened to include a hospital cot in a quiet part of the shop. Some firms, it seems, permit employees to vote on what recreational departments shall be added, such as pool tables, bowling alleys, tennis courts, etc.

Space Donated by Employer

In all but three of fifty-seven plants queried on the subject, the space devoted to employee betterment was donated free by the employer. In three a moderate rental was charged. But this was due to the fact that in these three plants the department was under the control of and financed by the employees' co-operative society into which all employees paid dues. In two of these, the firm made the charge at the request of the employees who did not appear to want any donations.

It is recommended by the majority of those in the industry who have given the plan a trial that the co-operative plan be restricted to insurance and sick benefits alone.

The laying out and operation of even a small welfare unit requires a degree of administrative skill which the average group of employees have not the time to acquire or to apply.

It is necessary to make recreation systematic and to offer selected entertainment. Outdoor and gymnasium sports if funds permit, are best. Moving pictures are shown which are instructive as well as entertaining.

The plant electrician in most plants proves to be the moving picture operator in half of which instances he is paid a small salary for his time on the job.

The small place can only hope to go far enough to weld their employees together—to make for better co-operation and for efficiency. The state of inefficiency in certain plants where no welfare is practiced at all is the best proof that even a limited effort in this direction will be a good investment.

A good many employers have found that it was necessary to make clear just what was intended in broaching the subject of welfare to employees. Violent prejudice against it has been found in many shops. But this resistance is not hard to break down if the proper methods are used.

The resistance met in the beginning has been largely found among foreign born operatives who are apt to totally misunderstand a co-operative movement that involves dues. The consensus of opinion seems to be that the employer should never finance a welfare unit without help from the employees in some form or other. He should merely help financially and furnish the organizing power. Welfare service which is entirely free is apt to do more harm than good.

Ties Employe to His Job

"Our welfare efforts," wrote the employer of 400, "have, over a period of six years, greatly reduced our labor turnover. They have tended to cement strong friendships between employees who might not otherwise take any interest in each other. They have fostered a spirit of co-operation that is extremely valuable at all times. . . . . Our records show a steady increase in production beginning the first part of 1919 when we had our welfare work well under way. . . . . I have been struck with the reduced amount of absenteeism, which we trace directly to the spirit engendered by betterment."

Of course visiting nurses, dietitians to visit homes of employees, complete dispensaries and dentists' offices are only extreme developments of the welfare idea; but they do exist in the largest plants and the industry is rightly proud of them.

Yet most of these things can be done on a small scale for smaller payrolls. A competent woman who is a nurse can operate a unit for as many as 400 employees for which she is paid from $40 to $60 a week.

The larger employers of labor make a definite tieup of their employment departments with their welfare service. This is probably a logical method, but it is not universally followed. In fact, it has been stressed in two cases at least that this way is not the best way.

One employer maintains that any firm employing 400 persons will put too great a load on an employment manager if he is also asked to direct welfare and vice versa. Yet, in the small plants this plan should prove feasible.

It is an accepted theory among those who have spent years studying sociology that the recreation commonly sought by industrial operatives is not conducive to their welfare nor to their satisfaction. There are several reasons for this. One is that under present conditions, the worker cannot get what recreation he wants at the price be can afford to pay. He cannot join a club for tennis, bowling or other exercise, and while he can find plenty of pool rooms and bowling alleys, he does not find a wholesame atmosphere for his welfare.

Directed recreation brings to the industrial operative not only those benefits of a physical nature, but also gives a mental stimulus; and it certainly is not the purpose of directed recreation to cram amusement down the throats of employees. Well directed betterment gives the employee an opportunity to enjoy sports and amusements he would never think

of seeking unaided and at the same time gives him that companionship which he stands most in need of.

A plant employing, say, 100 persons can easily afford a reading and rest room, small though it may be, a tennis court and an adequate first aid layout. Moving pictures can be shown at trifling cost after the projector and screen are paid for. Dances and parties properly arranged bring the families of workers together and in this way tend to inculcate the community spirit which has been responsible for the success of at least a dozen of the leaders in the industry.

If as many superintendents claim, it costs from $100 to $500 to fire or lose a trained employee, and if employee betterment will, as claimed, reduce this turnover even a small percentage during the year, the employer is rebated for any outlay he may make at the outset.

Waste in the Pulp and Paper Industry

The Finishing Room

By B. T. McBAIN

AT PORT EDWARDS, WIS., the paper mill superintendent was asked as to the percentage of waste he was having at his sheet cutters. He said six to seven per cent. At that time he was running a 120-inch sheet of paper and trimming the edges, getting out a sheet 48x48 or 96 inches wide, wasting 24 inches or one-fifth of the sheet. Now 20 per cent is greater waste than any mill ever averages, but it should not be allowed at any time. The trim was 12 inches on each side, yet there were orders for 24x36, and there was no reason why the cutterman should not have made stock. Thereafter he did.

However, this is but one waste of the finishing room, and I will endeavor to point out some more.

I went into one mill one day and was told that the finishing-room waste on actual weighing was only 2 per cent. An investigation showed that the roll paper was being trimmed at the winders of the paper machine and the cutters only charged with the trimmed jumbo roll, no matter how narrow the finished rolls might be. The waste was there just the same.

There are too many salespeople accepting orders for sheet papers at the same prices as for rolls, and then not demanding a full trim for the paper machines, especially on special orders for weights and qualities not regularly sold. The waste is enormous, and many times the selling price does not even come up to the cost. This is waste over which the finishing room has no control, but there are many wastes in that department in many mills which should be stopped, over which they do have control.

First, in most finishing rooms there is too much help. I have seen the labor cut in two and the production increased. Many mills employ girls in the finishing room. When fully employed they are an asset, but when only partially employed and men are supposed to be working in the same department they are many times a liability.

Again, many mills waste labor and have greater finishing costs because they do not have sufficient equipment; some have enough sheet cutters to reduce the rolls to sheets and then the work is hampered at the trimmers, causing a large part of the help to remain idle on certain orders because the paper is blocked in process.

Many men working at the sheet cutters cause a great waste of paper by tearing off large slabs of paper from the jumbo rolls when cracked on the edges, when a shifting of the roll in the frame or stands and cutting the split edge off with a sharp knife would do the work as well.

Again, much paper is cut into sheets and finished, such as wet paper—"oily sheets" as the customer sometimes terms them—which should better be cut out and sent to the beaters while the paper is still on the machine. In fact, the winder man on the paper machine should never allow such paper to get into the rolls, but when it does get by the cutter people should eliminate it.

A great waste in finishing sheets is one where a 10- or 20-roll sheet cutter is used to cut one or two small sets of sheet rolls, and the set producing only one ton of sheets when it should turn out five.

Very few mills know the grade costs of their sheet papers, preferring to use an average cost figure as the cost of sheets.

I heard a little girl say, when figuring interest at school, that compound interest didn't cost as much as simple interest, and she could prove this. This is about the same argument that is put up by many mills when they say sheet papers do not cost any more to make than roll papers.

There are few finishing rooms with less than 10 per cent waste between the trim of the machine and the finished sheets, and on many orders the waste greatly exceeds this figure.

Look into this and then correct the selling price of sheet papers as compared with like weight and quality in rolls.

Foreman Training in the Paper Industry

Training Foreman by Conference Method

By J. K. NOVINS

Author of "A Training Program for the Factory Foreman," "Foreman Training in Practice," "Manual of Practical Training for the Railroad Foreman," Etc.

THE AVERAGE foreman, despite what he lacks in the way of formal schooling, possesses an undue amount of technical knowledge and executive ability, but the difficulty is that this knowledge too often exists in a disorganized state. The object of the foremen's conference, of the type promoted by the Federal Board for Vocational Education and by the various state boards, as described in other articles, is to draw out this knowledge and to get the foreman to realize the necessity of increasing the knowledge along definite lines. Essentially, this type of training is to help the foreman analyze his own problems and to help him find his way in the mazes of modern intricate factory organization.

The writer has had the opportunity to examine the methods pursued and to examine the results achieved by these methods in more than a score of factory plants in various parts of the country, and in this article he will describe the content of the conference method as utilized in several plants in the paper industry, such as the A. M. Collins Manufacturing Company, at Philadelphia, Pa.; The Bemis Bros. Bag Company, at Seattle, Wash.; The Champion Coated Paper Company, Hamilton, Ohio; the Gardner & Harvey Company, Middletown, Ohio, etc.

By means of this type of foremen's conference, a group of foremen employed in one plant or in several plants meet for a series of consecutive conferences arranged for a short period of time, such as ten days or two weeks, with a sum total of anywhere from thirty to about seventy hours, during the foremen's working time on company time. Or the sessions may be spread out a longer period of time, in which case the foremen meet once a week. In either case the same method is followed and the same content is taken up.

The conference is led by an experienced leader appointed for the purpose by the Federal board, by the state educational board, by the local university cooperating with these two agencies, or by a company man specially trained by the above agencies in the methods of leading such a conference. The group rarely comprises more than twenty foremen, all of whom, as far as possible, are of equal rank as plant executives. This phase—the organization of the group—is treated in detail in another article.

Developing Discussion

During the conference the foremen, with the aid of the leader, analyze and discuss their duties in relation to the operation of the entire organization; they discuss methods of supervising and managing the working forces under them; they discuss the important problems of accident prevention, welfare work, production efficiency, administrative duties, and the methods of instructing new and experienced men on the job. With these objectives in mind, the leader merely suggests questions and problems bearing on the subjects, and gets the men to discuss these questions and problems in such a manner that they arrive at well-grounded conclusions.

Only two kinds of conference methods have been developed successfully, the question and case methods. Either the men are asked a series of questions by the leader, or they are presented a number of verbal or written problems and cases. These questions and cases are so worded and are so arranged in series as to provoke discussion along a line that will aid the foremen to arrive at the desired conclusions.

The purpose of the intentive conference is readily apparent. First of all, it is the best method of introducing foreman training in the plant. The men are made to see for themselves the importance of certain executive problems in their particular organization, and these problems are brought up by the men during the sessions, which is not the case in a purely lecture method or in an unorganized discussion. Second, there are few or no restrictions as to the manner in which the men discuss these problems, depending, of course, on the tact and leadership displayed by the conference leader. Third, as the men realize the importance and broader possibilities of the matters under discussion, they become convinced on the necessity for some sort of permanent educational program for the discussion of these and similar problems that may come up in the organization. Therefore, the intensive conference is employed as an entering wedge, and almost invariably it is followed up by some sort of permanent training.

In another article will be described the work of the conference leader, but here we will present a resume of the factors that make for successful conference leadership. The first, of course, is the matter of maintaining the interest of the men in the discussion. The leader is apt to overestimate the interest of the men in certain phases of executive management. The leader must be prepared to sense the lack of interest before it gets too far, and tactfully shift the discussion to a more interesting matter. Second, in dis-

cussing the foremen's relation to the men above and under them in the respective plants, the foremen are apt to step on dangerous ground by insinuating the attitude of the higher officials, much to the chagrin of the latter. The matter of personalities should never creep into the discussion, which is something for the tactful leader to take care of. It can be avoided by having the men discuss their own decisions rather than receive the crystallized decision on a ticklish plant policy from the leader. The purpose of the foremen's conference is not to settle the firm's policies, but to help the foremen understand the firm's policies and how they can co-operate with the management to carry them through.

Routine of the Conference

To illustrate how the idea is carried out the writer will summarize the conference held at the A. M. Collins Manufacturing Company, and then he will show how the plan was used at the Bemis Bros. Bag Company and other paper plants.

At the first meeting of the foremen the leader explained the purpose and scope of the conference. The men were led to analyze their responsibilities as foremen, to show the foremen how proper training by means of the conference method will help them exercise their responsibilities better. Also, to illustrate how scientific analysis of a problem will help the foremen, the foremen discussed different phases of carelessness on the job. The foremen discussed different kinds of carelessness and how they could be remedied. This discussion closed the first day's session.

On the second day the foremen began with a discussion on the foreman's responsibility for the physical conditions of his working force. After making broad classifications, the foremen drew up a table showing the cost factors involved and the ways and means of dealing with the problem. A number of cases were presented and discussed as applying to the A. M. Collins Manufacturing Company plant. The second day ended up with a discussion of the foreman's supervisory responsibilities. The foremen drew up charts showing the relative importance of each supervisory duty and the proportion of time spent on its performance by the individual foreman.

The third day was consumed by discussion on the subjects of orders, directions and suggestions. After considering the principles of a good order and discussing practical cases, the foremen discussed such points as "When to give a snappy order," "When to use directions," "When to use suggestions," and "Advantages of written orders."

Types of jobs, analyzed as service, production, technical, maintenance and instruction jobs, were discussed on the fourth day of the conference. After classifying their individual jobs in the respect to the above demarcations, the foremen discussed the interrelations of the various types. This led into a discussion of job analysis, and after definitions were disposed of the foremen carefully analyzed a number of jobs.

Qualifications of Workers

Under the broad classification of "The Qualifications of Workers," the foremen on the fifth day discussed such factors as determination of the physical and mental characteristics workers should possess for given jobs; to decide to what extent qualifications beyond those needed for the immediate job for which a man is hired should be required, and to what extent should qualifications govern the selection of men for the various departments.

On the sixth day the foremen discussed various ways and means by which foremen could promote interest and satisfaction among the working force, with illustrations of specific cases to show how foremen in the different departments in the Collins plant should handle the cases. The foremen also made a graphical layout of the interest factors. From that the foremen entered on a discussion of labor turnover and how to reduce absenteeism.

On the seventh day of the conference the foremen discussed such important topics as production factors and their control, production wastes and their control, and co-operation as it relates to foremanship. The subject of co-operation was continued to the eighth day, when the foremen discussed co-operation with superior officers, co-operation with the working forces and co-operation among the foremen.

The instruction job of the foreman was covered by discussions during the ninth day. First the foremen discussed what the individual foreman should know about his job and about the plant in general. His job as an instructor of men was then discussed and the various methods of instruction of help in use taken up in detail. This was followed by the methods of instructing help. The instruction process was analyzed into four steps: secure attention, presentation, application, and checking or inspecting results. The foremen then listed trade terms for use in instruction and actual instruction processes demonstrated. The tenth and final session of the conference was devoted to a consideration of the principles of good teaching, and the foremen applied the knowledge gained during the ninth session by demonstrating sample instruction processes.

While the same method of training was followed at the conference of foremen at the Bemis Bros. Bag Company, the subjects were taken up in a slightly different order. As in the Collins conference, the first subject for discussion was the foreman's place in industry and a classification of the foreman's job. Orders, directions and suggestions were taken up during the second meeting. Departmental and job analysis was discussed during the third meeting. During the fourth meeting the foremen discussed the distribution of supervision. Production difficulties

consumes the fifth and sixth sessions. The seventh meeting was devoted to instruction. Interest and satisfaction factors required two meetings for discussion. The final session was devoted to discussions on co-operation.

The following outline will best describe the order of discussions at the plants of the Champion Coated Paper Company and the Gardner & Harvey Company. Both conferences were led by Mr. R. W. Jones and the same outline used for both.

Foreman's Place in Industry

The first session began with a discussion of the foreman's place in industry. The groups then developed the sort of responsibilities exercised by the foreman on his job as a foreman, and how these responsibilities react on the worker.

The next subject dealt with orders, direction and suggestions. A number of cases and problems were presented by the leader, and each was discussed by the foremen. The following meeting was devoted to a discussion on carelessness on the job, and the men then drifted to a discussion on accident prevention.

Other subjects developed during the series of meetings were in the following order:

Co-operation. In addition to discussion of principles, the men charted the comparative values of factors which enter into good co-operation.

Handling Material. The foremen discussed their responsibilities with regard to handling materials, indicating and measuring the importance of each item involved in the handling of material.

Leadership. Qualities of good leadership. Factors indicating good leadership. Many cases presented and discussed.

Job Analysis. Job analyses of a number of department jobs conducted during the session.

Instruction of workers.

Testing Foreman's Analytical Powers

At the close of a conference held recently in a plant in Ohio, the leader presented the following question, to test the foremen's analytical powers:

"By what facts should a foreman be governed before he finally recommends the purchase of new equipment? What questions should he ask of himself? Of others?

Each foreman in the group contributed his suggestions, and following is a list of these suggestions:

"Is there a possibility of the new equipment serving the purpose?"

"Consider the cost."

"Get information as to the best type of equipment."

"Determine the expected results."

"Specify production demanded under 'rush' conditions."

"Interest on investment."

"Will it pay for itself? When?"

"Degree of labor saving."

"What is the resale value?"

"What are the opinions of the present makers of equipment?"

"Maintenance of equipment."

"Date of delivery."

"Interchange of parts."

"Will it fit into a standard equipment?"

"Is it easy to repair? Are the parts accessible?"

"Does the equipment demand the service of a specially trained operator?"

"Is there a supply of such operators?"

"Can the equipment be used for any other purpose?"

"How much floor space is necessary?"

"What are the safety precautions involved in the use of new equipment?"

"Are funds available?"

"Will it add to the service reputation of the company?"

"What is the business reputation of the company making the equipment?"

"What is the cost of operation?"

"Will it work under severe conditions?"

"Will it work under local conditions?"

The Organized Group-Discussion Plan

DIFFERING from the lecture study plan employed in the Dennison plant from the Federal board conference plan as employed in the A. M. Collins plant, the Champion Coated Paper Company plant, the Gardner & Harvey Company and other paper houses, is a method of foreman training that has been developed by a large manufacturing concern in Ohio.

It can be called the organized group-discussion plan. It has proven most effective as a means of stimulating self-training by the plant foremen, under the tactful leadership of a plant official. It differs from other group discussion methods in that the series of discussions follows a definitely planned program, which is gotten up by the company's educational director, with the assistance of committees of foremen. Also, the series of discussion conferences arranged for a season forms part of a definite training program outlined for several years, each series following up the previous series. So one of the chief qualities of this plan is that it follows a uniform and definite aim and serves to keep up the active interest of the foremen students during the life of the entire educational program.

This plan has been consistently followed at the middle-west plant the past four years, during which time over four hundred foremen-executives have followed the training. At present 290 foremen are taking the training, 40 per cent of whom have attended the group discussions held weekly continuously since

1920. The plan as worked out in this plant has attracted nation-wide attention, and many educators and plant executives have visited the concern to observe the methods of its operation. One man who speaks very favorably of this method, as a result of personal observation, is Mr. R. W. Jenkins, leader of the foremen conferences at the Champion Coated Paper Company and the Gardner and Harvey Company plants. As a result of a recent visit to this Ohio plant, where the writer personally observed the methods and talked to Mr. F. W. Bacon and the other company officials, the writer will set down faithfully the details of the method followed by the company in the organization and conduct of the organized group discussion. This information, the writer believes, will prove of constructive interest to the executive in the paper plant.

This method can be used as a follow-up to either a series of foremen's conferences along the Federal Board plan, or to a series of lecture and class courses for the foremen. The winning virtue of this plan is that, except for the planning and organization work by a higher plant official, such as the educational director of the company, the entire course of instruction is entirely delegated to the foremen themselves, who conduct the discussions on the democratic committee system. Let us now review the development and operation of this plan.

Outlining the Course

In 1920 an educational committee, consisting of the educational director, the employment manager and other personnel officers, was appointed to make studies of foreman training methods as pursued in other plants, and to make recommendations and compile text material for a course. The text material the first year was presented in the form of weekly lectures for eighteen weeks, and covered the following subjects: Principles of Industrial Organization, Industrial Organization and Management, Apparatus, Designing the Product, Plant Layout and Equipment, the Production System, Time and Motion Study, Inspection Methods, Plant Construction and Maintenance, Cost Findings and Records, The Shop Executive, An Analysis of Production and Cost, Dealing with Men, Employment Management, Wage Systems and Industrial Training.

This was the elementary course. It was presented to small groups of foremen, eighteen men to one group. The following year the course prepared was known as "Industrial Organization and Production Methods," which was presented to four groups, 34 men comprising a group. The subsequent course was known as "Fundamentals of Economics," presented to four groups of 30 men each. Each course followed in order, and served as a prerequisite for attendance of the succeeding course.

The subject matter comprised in the "Industrial Organization and Production Methods" course covered the following topics: Organization and Incorporation, Design, Processing, Equipment, Layout, Tools, Plant Production Methods, Rates and Wages, Assembly, Inspection, Cost Accounting, Finance, Purchasing, Personnel, Sales, Advertising and Service. The subjects covered in "Fundamentals of Economics" were outlined as follows: Waste in Industry, Introduction to Economics, Primary Industries, Manufacturing, Statistics, Graphic Presentation, Production, Distribution, Railroad Transportation, Automotive Transportation, Power Transmission, Marketing Consumption, Enterprise and Business Organization, Financing of Production, the Organizing Functions and the Determination of Prices.

Enrolling Foreman-Students

A call for foremen to attend the particular course is by letter sent by the Educational Director, and the foremen interested fill out an enclosed application blank. The letter is tactfully worded, pointing out the importance of the course and how it will help the foreman solve his executive problems. The letter sent out to prospective students for the Fundamentals of Economics course, conducted this year, was worded:

"The mere mention of the study of economics carries with it the impression that the fundamentals of the subject can be obtained only by those technically trained.

"This, however, is not the case. The fundamentals of economics—'the science which deals with the activities of men in gaining a living,' can be learned and applied by anyone who desires to give time and thought to the subject.

"It is the purpose of the course, 'The Fundamentals of Business (Elementary)' to touch rather fully on the non-technical phases of the study of economics. Inasmuch as these are fundamental factors which govern the successful operation of any business it is well that every person who aspires to positions of greater responsibilities, know the principles of economics.

"Thus, those who are engaged in this study need not be disturbed at the name 'economics,' but should realize that this study gives them a splendid opportunity of obtaining knowledge of the fundamental principles which govern the operation of all business enterprises."

Grouping the Men

The next step is for the Educational Directors, or whoever is in charge of the training program, to group the men in committees of three men each, with one of the men to act as chairman of the committee. Each committee leads the discussion during the session assigned to it by the Director. In grouping the men in committees the Director aims to bring together three men from different departments, and also arranges that at least one of them be experienced in the form of training prescribed, and this man gives

the other two men the benefit of his experiences. Sixteen committees are appointed to lead the discussions during the sixteen sessions of the course. The committee meets outside, makes researches on the particular topics assigned, makes its report to the foremen meeting and then leads the discussion.

A foreman is assigned to give a brief report at each session on some current report on business conditions, such as is issued by Babson's, by the Federal Reserve Board, or by the research department of some banking or financial institution. A different foreman is assigned for this work at each session.

At each session a foreman is assigned to report on some magazine article he had read, relating to business methods and organization. The report may be based on an article in a popular technical or purely trade magazine.

Each foreman has assigned to him a certain topic on which to talk during the group session. Due to the nature of the products manufactured by this Ohio concern these topics relate chiefly to transportation. In a paper plant the topics assigned can cover such subjects as, "The Evolution of the Paper Box Industry," "Creating New Markets," etc.

Scheduling the Group Discussions

These matters disposed of, the Educational Director then schedules the sessions of the discussion groups. But before that, each group elects its own officers—president, secretary and treasurer. The president opens the meeting, the secretary reads the minutes and other communications, and makes record of the session proceedings. The treasurer is in charge of financial arrangements regarding dinners, outings, etc., arranged by the group.

The following is the schedule arranged for each group session:

1. Meeting Called to Order by the President.
2. Secretary's Report.
3. Report of Committee.
   (1) Chairman.
   (2) Committeeman.
   (3) Committeeman.
   (Report of the three committeemen consumes 25 minutes.)
4. Discussion of Subject and Problem by Class—15 Minutes.
5. Study of Current Business Conditions.
   (1) Economic Service Report.
   (2) Graphic Charts.
   (Consuming 10 Minutes.)
6. Facts and Figures of the Industry and the Company's Part in It—5 Minutes.
7. Report on Magazine Articles—10 Minutes.
8. Discussion—10 Minutes.

Text and Problems

A text is prepared for each session, which is handed to each foreman a week previous to the meeting. This text, upon which the discussion is to be based, must be read by the foreman. The text is accompanied by a sheet containing three problems, the answers to which are to be written out by the foreman and handed in to the Educational Director before the meeting of the regular group. For instance, the text on "Manufacturing" was followed by the following three problems:

"1. Give your reasons for America's industrial leadership when European countries experienced the Industrial Revolution first.

"2. Name a dozen products of the generic industries which are used in manufacture.

"3. Name two types of combinations and give existing examples of each."

The following is a typical answer to the third question, as handed in by one of the foremen:

"Two types of combinations are: 1. Horizontal combination, enterprises of the same line consolidate, as illustrated by the General Motors or the F. W. Woolworth Co. 2. Integrated industry, controlling mines, railways, steamships, manufacturing, etc., as illustrated by the United States Steel Corporation."

The rules relating to the reading of texts and answering of problems are stated as follows:

1. Text to be given out one week in advance.
2. Problems to accompany each text.
3. Answers—Each class will have three days in which to answer problems.
4. Answers must be in as follows:
   Monday Class—Thursday.
   Tuesday Class—Friday.
   Wednesday Class—Saturday.

Best Time for Meetings

The sessions are generally arranged during the winter months, beginning in November and ending up in March. Summer is considered a poor time in which to conduct such training. A recess is taken before Christmas, and the sessions resume in January.

The first meeting is a general one, of an inspirational nature, and is usually addressed by an outside speaker. The second meeting is known as an organization meeting, when committees are announced and the organization details made plain to the men. A talk is then given by the Educational Director on some important topic, such as "Waste in Industry."

The foremen are rated, on attendance and on problems handed in, on a fifty-fifty basis. The following is the rating record kept by the Educational Director:

Instructor .....
Department .....

Name	Dept.	Days Pres.	Days Abs.	Papers Sent In	Av. Grade Paper	Final Paper Grade
John Doe		18	1	20	88	92
Art Done		16	3	17	90	86

"The classes are conducted on factory time," said

Mr. Bacon, the company's Educational Director. "To give an idea of the interest shown in the work, the class attendance in percent averages around ninety percent and the other ten percent is caused by sickness or factory work."

Stimulating Attendance

Toward the end of the course, when interest is apt to lag, punctual attendance is stimulated by arranging a banquet, under the unique conditions explained in the following letter sent to the class members February 7, 1924, by the secretary of the special educational committee:

"About the second week in March we are going to have a banquet for the members of the Fundamentals of Business Classes.

"Prior to the banquet, however, we are going to have a bowling match between the representative teams. The losers then will pay for the dinner as has been the customary practice in the past. It will not cost any losing member more than one dollar.

"An effort will be made to secure President Hicks, University of Cincinnati, to be the principal speaker that evening.

"We are going to make this a regular night and we want every fellow listed in the classes to plan on attending this banquet.

"Starting next week, percentages will be kept on the class work. This will include attendance and answers turned-in-on-time records. The leading class in this respect will be given the place of honor and a standard showing the position.

"The committees on 'Power Transportation' headed by Mr. Elwell (Class 1) and Mr. Bradford (Class 2) have promised a real discussion next week. If you want to get a close-up picture of what this super power development will mean economically to the nation, hear these discussions."

The records of attendance are kept on file, and are often consulted by the heads of departments when considering certain foremen for promotion.

The Educational Director supplies the men with a bibliography of books and magazine articles to consult in connection with the preparation of their reports. Certain of these books and magazines are kept in the company library, and are loaned out overnight.

Learning to Run a Paper Machine

By OLD MACHINE TENDER

IN THE old days of paper making, when machines were slow in speed and narrow in width, the youngster in paper making had a much better opportunity of learning how to run a machine than he has today. For at that time, we seemed to have more time than we do now, and many a green boy was developed into a first class machine tender.

The first question that a boy who wishes to become a machine tender, usually asks, is "how long does it take to become a machine tender?" The answer to this question depends upon various things: First, the boy's adaptability to this kind of work and his ambition to put forward his very best efforts; secondly, the men with whom he works. Under favorable conditions, he should be able to operate a paper machine after three years of apprenticeship.

The writer knows of extra capable young men who became good machine tenders in two years, but they went into the business with the firm intention of going ahead as rapidly as possible. In general practise, four years is the time served before promotion to machine tending comes.

The first and best thing for the beginner on the paper machine to do is to thoroughly master his first job, which on the wide and fast machines is that of fourth or fifth hand. In this position, he is supposed to keep the floor clear of waste or broke paper and his part of the machine, the winder in ship shape. He is the assistant of the man one step further along towards his desired goal, and he must watch this man closely and learn all the details of his job, after he has mastered his own in such a manner that he is commended for his work. He must not complain about doing some work that should be done by someone else, for that is where his opportunity of learning how to do the other fellow's job comes about and makes progress possible.

Every minute of the beginner's time in a machine room can be well used for his future success, for everything done by the third hand, backtender and the machine tender about the paper machine is done for some reason, and every time that it is possible to have them explain to you why they did this or that, by all means get the explanation. At certain times you may be unfortunate enough to get something very different, especially if the paper is breaking and the machine tender is a little bit excited. At such times it is not advisable to request a reason for his actions, for he is apt to remember your lack of tact for some time to come and may decide that you would never make a machine tender. So at these times, wait until after the rumpus is over before asking, but keep in mind just what happened and what was done to rectify it. Do not ask too many questions, or they will consider you a nuisance.

Do not concern yourself with any one's work until you have thoroughly mastered your own and are ready for advancement, and then do the next man's

work every time you get the opportunity, and when your promotion comes you will be prepared to step into the job and successfully perform its duties. When you have your first promotion, repeat over what you did on your first job. Study it and become proficient in it before you begin to look for the next step upward.

Duties of a Third Hand

When you become third hand, your duties will consist of assisting the backtender and running the winder. You will learn how to "skin" the paper from the press rolls, in other words, tear a "tail end" for the backtender, so as to take the paper over the machine. This is the beginning of your handling of the paper, and if you are going to become a real paper maker you will get your first big thrill when you succeed in tearing your first "tail end." And from that time on and until sometime later you will welcome breaks of the paper on the machine, so you can have the fun of tearing some more "tail ends."

Some day or night, when the machine tender and the back tender are good natured, they will give you your first try at taking the sheet over the drying cylinders, and you will be about as nervous and shaky as you will ever be again while you are a paper maker. If you are like most fellows who eventually turned out to be first class machine tenders, you will most likely burn your fingers on the hot dryers if you do not let the paper go around and plug things up. After you have done the trick of taking the paper over the machine successfully, you will get an idea that you are at last a real paper maker, but at this point you are just really beginning. You will forget for a time that there is anything to machine tending but the handling of the paper. If you are wise, however, and have your eye on the ultimate goal, you will appreciate being clever in handling the sheet, and so will your machine tender. Every machine tender loves a backtender who is neat in feeding the paper over the machine, for he saves a lot of "broke" and helps production. However, there is a little more to good machine tending than being able to cleverly handle the paper on the machine.

After you have had your first experience in taking the paper over the machine, it would be well to get back to your job of third hand, and become nothing short of the best in this kind of work. In order to reach this, you will have to realize several things that a great many third hands neglect.

On most machines, the back-tender is supposed to look after the making of the reel and be careful in inspecting the paper as it winds. He must be sure that it is free from all defects, such as spots, wrinkles and other marks. At the same time he must make the paper evenly calendered. A good backtender will build a reel, so that the finish of the paper is equal over its entire width. He must also be able to judge the drying of the paper, as it is most important that the sheet be uniformly dried, since it affects the finish as well as other qualities of the paper. A good hard reel is secured by manipulating the weights on the calender levers, and the cold air which is blown through pipes onto any desired part of the calender rolls. The reel of paper showing soft means that there is too much pressure on the sheet at this particular spot, and it must be relieved. This can be accomplished in different ways. If the reel is soft on its front edge, the calender weights on the lever on the front side of the stack are shoved back or taken off, and this relieves the pressure on the sheet, and shortly the reel will begin to harden at this place.

If the middle of the reel happens to become soft, it usually means that the calender rolls have become too hot, and the cold air is applied and has the effect of cooling the hot place in the roll, causing it to become smaller, thus relieving the pressure. Very often, the calender rolls will reach a condition where it is impossible by means of the calender weights or air pipes to overcome the soft or hard places in the reel. Then it is that the judgment and ingenuity of the backtender is tested. It may be that a calender roll doctor or some part of its blade is pressing to heavily against the roll, causing a friction, which is overheating the roll at this particular spot. Or perhaps a certain spot in the rolls causes a hard spot in the reel of paper as it winds. To remedy this condition, a piece of canvas or jacket is placed between the doctor roll blade and the calender roll which heats the roll, and thereby overcomes the defect in the reel.

The third hand, who wants to succeed, must watch these things very closely, for when he becomes backtender this will be his work. The backtender's work around the calenders directly affects his work on the winder, for it is most difficult to have good rolls off the winder if good hard reels are not made by the backtender. When badly wound rolls come from the machine, the cutter men usually blame the third hand, and give him a bad reputation, which is bound to get to the ears of the boss and affect the third hand's chances for promotion. When the third hand can assist the backtender in building good reels, he helps himself in many ways.

A good third hand will keep in mind all things that will aid the production of good paper and rolls from the machine. If the machine is making roll paper, he must be extremely watchful while the rolls are being wound because when paper leaves the mill in rolls, the consumer or one who prints it, does not expect to find cracked edges, torn sheets or poor splices and spotty paper. The third hand's duty, therefore, becomes very important, and he must keep his eyes sharply on the paper to be sure of its perfection. Third hands seldom realize the importance of their position in connection with this, and many

a mill has gotten into serious trouble through the carelessness of the third hand's work. Of course, the third hand seldom hears of such trouble, for the reason that the complaint is given to the machine tender who is supposed to be responsible for the third hand's work. The machine tenders, however, must depend upon their third hands for carrying out the duties of their work, and results would be better if the latter appreciated their real responsibilities. The slitters that trim the edges of the rolls must be kept in good condition, and the smart third hand will always have these things in mind and be alert to recognize and report the slightest thing that is wrong. A good and efficient third hand is usually a good backtender before he reaches that position, the only difference being that he then has the responsibility of the job and the opportunity of making the third man's work what it should be.

The Back Tender's Duties

The duties of the backtender, of course, are more important than those of the third hand, and every machine tender will admit that a competent backtender can help a machine tender's reputation more than any other one factor. The machine tender must depend upon the backtender for uniform quality at the dry end of the machine. The writer knows of one sore-headed backtender who was the cause of two machine tenders losing their positions. He would not report defective paper to the machine tender but would let it pass on. He continued doing so until the boss could stand it no longer, and instead of putting the blame where it rightfully belonged, he put it up to the machine tenders, who failed to insist that their backtender was at fault, because they were afraid that they would show to much dependence on that worthy. They should have done so, however, and insisted that the backtender was the one who should leave the job.

A good backtender appreciates his responsibility and has great respect for his machine tender. A fellow who figures on getting ahead in the business of paper making, will do all in his power to make his machine tender's work as perfect as possible, and is usually rewarded by being shown the ins and outs of machine tending. The backtender may be on the job for sometime before he begins to realize the responsibility that goes with the job of machine tending. If he has progressed properly, he will have some idea of how the machine is started, and the importance of the machine clothing equipment, and its effect on the operation of the machine. He will first become interested in how the machine tender knows just what to do when he is changing weights or speeds of paper, and how he knows when the machine and felts should have a washup, and what breaks the paper now and then. Planning to become a machine tender some day, the watchful backtender will edge around until he gradually secures this information, little by little, and any good machine tender is at all times willing to help a good backtender. But he must, as a backtender, do backtender's work and pick up the other as best he can. He can learn to figure speeds and what should be done when a change of orders comes on, watching everything that his machine tender does, and following the same means of promotion that he did from the start of his work in the mill.

It is astonishing how many bright young fellows who have every possible opportunity of learning to become machine tenders, will neglect the chance and wait until they have the job thrust upon them without warning, and then have to struggle to hold the position. They slip up on the most simple problems, things they should have known well before they thought of taking the job of machine tender. They are not ready through their own negligence and many of them become failures, because they did not learn to run the machine while they were backtending.

A Speed Formula

In starting a paper machine, the first thing that a good machine tender does is to figure out the speed of the machine and the amount of paper he plans on making per hour. Following is an example:

Let us assume the machine was running two hundred and fifty feet per minute on book paper. The size and weight of the sheet was 25x38—60 and the machine was making four 25-inch sheets. The problem is worked out as follows:

1½x4 sheets equals 6.

6x60 (the weight of the sheet) equals 360.

360x250 feet per minute (the speed of the machine) equals 90,000.

90,000 divided by 38 (the length of the sheet) equals 2,368 pounds of paper per hour.

2,368x.96 equals 2,273 pounds per hour, the exact amount the machine is making at the speed being run.

It makes but little difference where the one and one-half, used in the above calculation comes from, and the young machine tender does not have to worry about it.

If your machine was making, or was running 200 feet per minute on 33x46—80 before the change onto the above order, it would be making per hour, on three 33-inch sheets:

1½x3 sheets, equals 4½.

4½x80 (the weight of the sheet) equals 360.

360x200 feet per minute (the speed of the machine) equals 72,000.

72,000 divided by 46 (the length of the sheet) equals 1,565 pounds per hour. 1,565x.96 equals 1,502 pounds per hour being actually made, when there are five hundred sheets per ream. If the order called

for 480 sheets per ream, the amount being made per hour would be 1,565 pounds.

Thus you determine that if you decide to run two hundred and fifty feet per minute on the order for 25 x 38—60, you will make 771 pounds more per hour, which in most instances would be too great a jump, unless it was a different grade of stock and a much freer one.

If when you are making the 33x46—80, you found that the quality of the paper, the drying and finish were satisfactory, and that the machine was doing about all that it could, you would want to make about the same amount of paper per hour on the 25x38—60, you would figure it this way.

Remember, on the 33x46—80, you were making 1,502 pounds per hour, and you wish to make the same amount on 25x38—60.

1,502x38 (the length of the sheet you are going on) is 57,076.

1½x4 sheets is 6.

6x60 (the weight of the sheet) is 360.

360 divided into 57,076 is 158.53, the speed at which you will have to set your machine, after you have changed the deckle to make your sheet one inch wider, as it was 99-inch and you are going to make it 100-inch. Now that you have figured so that you are going to make the same amount of paper per hour, you will not have to change the stuff gate and the drying of your paper should be as it was on the previous order. Such a change, could easily be made without stopping, but the machine requires a washup and before you stop it, you have figured out the change you are to make and your mind is free to apply to the other tasks in hand.

It is not easy to give a paper machine a thorough wash up, especially where old papers and clay are a part of the stock formula, since these create considerable slime, which in turn produce spots and specks in the paper, if it is not carefully washed from pipes and screens. Felts must have close attention and be thoroughly washed. The wire should be inspected for spots or possible cracks, and everything possible done to make the machine productive. Very often a good machine tender will neglect to attend to something he should have done, while the machine was stopped and finds that it will have to be stopped again. It is a good plan, therefore, to make a list of all the things to be done before stopping the machine.

When all is ready to start, the machine tender opens the valves and gets the water circulating as it does when the machine is in operation, the only difference being the absence of the stock in the water. When this point is reached, he opens up the stuff gate and allows the stock to run in with the water, and when it has reached a proper consistency he pulls open the head gate on the head box, and the stock is on its way over the wire. Good judgment must be used in selecting the time at which the head gate should be opened. If the thickness of the stock becomes too great, and couch rolls are being used in place of a suction roll, it will be difficult to keep the stock from sticking to the jacket and possibly doing damage to the wire by passing under the guard board. The gate should be opened while the stock is slightly thinner than it is under actual running conditions.

It is desirable and the practice of good machine tenders to remove the sheet from the wire as quickly as possible, so as to save the stock and not let it run under the wire. Even if there is a save-all under the wire, it does not mean that some of the stock is not going to be wasted, as these save-alls overflow or the outlet becomes clogged. Therefore, the paper should always be passed from the wire to the first press with the least possible delay.

Allow the paper to run on the first press until you have made sure that the flow of stock onto the wire is regulated and that wire and felts are running and guiding safely. Then be sure the drying cylinders are properly heated to receive the paper. Many times hundreds of pounds of paper are wasted because the dryers are either too hot or cold to properly dry the sheet. If possible, the machine tender should follow the sheet over the machine and see it placed safely on the reel, and weigh the sheet as quickly as possible.

It is at these times of starting a machine that a good backtender is of immense help to a machine tender. He can look after the drying as well as getting the paper onto the roll and weighing the sheet, while the machine tender steadies things at the wet end of the machine.

Alertness Brings Reward

Of course all that has been said in this article relates mostly to the operation of a book papermaking machine, so the reader, whether he is employed in making book, news or any other grade will have to allow simply the principles laid down here to apply to his particular job. Every machine making different grades of paper has peculiarities of its own, known to the men running the machine; but if the third hand or backtender on that machine will follow closely as possible the work of his superior, he cannot help being successful in advancing to a better position.

The best machine tenders do not think they are any too good and are continually learning by closely studying their work and its problems.

The tail end of a wet break of the paper usually tells an interesting story, and the machine tender who can analyze or detect the cause of the break is the most successful. The writer knows of machine tenders who do not try to catch the end of the break to find its cause until two or three breaks have happened, and then they discover what caused it when they could have done so in the first break of the sheet.

No industry presents to the young man of today

greater possibilities than does papermaking, and he who goes into it with the intention of succeeding will have no difficulty in going forward and making his niche in the industry.

Manufacturers are very anxious to have promising young men in their mills, and if the proper spirit is shown every aid will be given towards their advancement.

If any of the readers of this article should desire further information in connection with what it covers, by writing to THE PAPER INDUSTRY the author will be glad to do what he can to help them.

Pointers for the Engineer

By W. F. SCHAPHORST, M. E.

Making One Reason Sound Like a List of 'Em

PAT is a first-class engineer, and he is also a first-class talker. Because of his ability to talk, even though a great deal of it is "bunk," he usually manages to get whatever he feels that his plant needs.

He wanted a feed-water heater and this is the way he got it: "Mr. Murphy," he said, "from the standpoint of coal consumption alone there are four good reasons why we need a feed-water heater: First, we won't use so much coal in a year; second, we will get more power out of each pound of coal; third, the theoretical and actual heat efficiency will be higher all around; and fourth, a great deal of money will be saved on coal. In all there are 'tin' reasons. If you want more reasons I will tell you them. Another reason, there's a big saving in coal on account of taking scale out—"

Murphy stopped Pat right there. "We'll get one immediately, Pat. Why didn't you tell me about this before?"

That night Pat told his wife how he did it by making one good reason sound like a list of 'em. "But don't tell anybody, Mary. I don't want Murphy to get onto my curves."

Feed Water Problems

THE writer has been asked whether or not trisodium phosphate is good for treating boiler feed water.

Its indiscriminate use in the opinion of one power plant specialist may be compared to the addict to a medicinal "cure-all," who takes his nostrum for all ailments from headache to footache. He is usually told by his more healthy friends that they seldom if ever use drugs, but go to a doctor and have the proper medicine prescribed whenever the body is in serious trouble.

The same reasoning applies to steam boilers. Trisodium phosphate may be all right for boilers in some cases and all wrong in others.

The proper thing to do, according to my way of looking at it, is to send bad boiler water to a "boiler feed-water doctor" and have it analyzed. The "doctor" can tell just what treatment is necessary and how it should be applied. Isn't that logical?

If you send a gallon to a specialist who comes well recommended, that will be enough for a thorough analysis. He will then have a correct scientific diagnosis of the ailment and be able to prescribe without any guessing. Advice obtained from such a source is of much more value than many pages of abstruse arguments on various chemicals written by people who favor one particular remedy.

Don't take the same medicine for every bodily ailment, and don't use tri-sodium phosphate for every boiler ailment.

A Steam Accumulator

IT HAS been understood for many years that the deadliness of fire tube boiler explosions is due to the large volume of hot water stored in them. The volume is much greater than the amount of water stored in water tube boilers. As stated in previous issues of THE PAPER INDUSTRY, fire tube boiler explosions are generally far more violent than water tube boiler explosions.

In other words, water is capable of storing heat and steam. Thus large tanks can be constructed to hold considerable water and they can be arranged to store valuable steam that would otherwise be wasted. Then when there is a special demand for surplus steam, the steam stored in this water flashes back into steam and we have an important saving.

In pulp mills where considerable process steam is required and the demand for the steam is irregular, when a valve is suddenly opened there is a considerable usage of steam for several minutes while the liquor is being heated. By the installation of an accumulator, it may be possible to save the cost of an additional boiler to provide sufficient capacity to take care of peak loads.

For example, if the temperature of the water is 250 deg., 4 per cent will flash into steam; if 300 deg., 9 per cent will flash into steam, and if 500 deg., 31.3 per cent will flash into steam. Thus the higher the temperature of the water, the greater its flash value, and the higher the temperature of any gases now be-

ing wasted, the greater the reason why their heat should be stored.

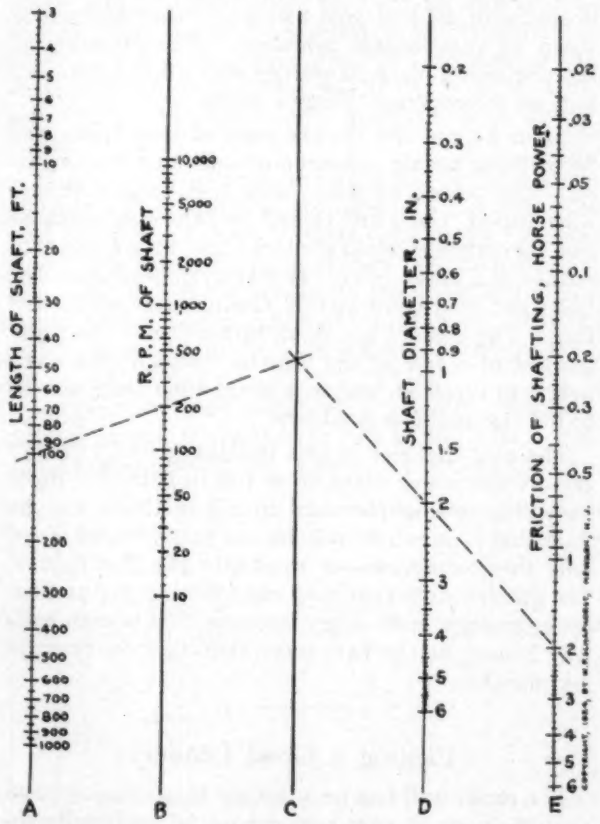
Friction of Line Shafting

FOR a number of years the writer has been searching for a formula by a recognized authority on the friction of shafting when normally loaded with belts and pulleys.

The one that appeals to me as being best is given by Goodman in his "Mechanics Applied to Engineering."

Inasmuch as his formula involves several multiplications including the cube of the diameter and a lengthy division, I have endeavored to simply the formula by means of the accompanying chart.

To use this chart simply zigzag across twice as



indicated by the dotted lines and the friction of the shaft is instantly given in Column E.

For example, if you have 100 ft. of shafting, Column A, and the shaft runs 200 R.P.M., Column B, run a straight line through those two points and locate the intersection in Column C. Then from this point of intersection run through the shaft diameter, which in this case I am assuming to be 2 inches, and the intersection in Column E gives the friction of the shafting as 2 H.P.

It will be noted that the range of the chart is great enough to take care of most problems met with in nearly every plant. The length of shaft ranges from 3 ft. to 1000 ft., Column A, and the R.P.M. of shaft, Column B ranges from 10 to 10,000, which surely are extreme figures. And the shaft diameter varies from 0.2 inch to 6 inches. The results obtained in Column E range all the way from .02 H.P. to 6 H.P.

Should it be desired to check the results obtained by the chart with longhand figures, the writer suggests applying the formula or rule upon which the chart is based as follows:

Cube the diameter. That is, multiply the diameter of the shaft in inches by itself three times. Then multiply that by the length of the shaft in feet, then by the R.P.M. and then divide by 80,000. The result is the friction in H.P. For example, checking the problem solved by the dotted lines drawn across the chart we have:

$$2x2x2x100x200 \div 80{,}000 = 2 \text{ H.P.}$$

Fuel Value of Wood

THE following in regard to the fuel value of wood is paper No. 98, of a series of technical notes issued by the Forest Products Laboratory, U. S. Forest Service, Madison, Wis.

Two pounds of dry wood of any non-resinous species have about as much heating value as a pound of good coal. Speaking in tons and cords, a ton of coal may be taken as the equivalent in heating value of one cord of heavy wood, one and one-half cords of medium-weight wood, or two cords of light wood.

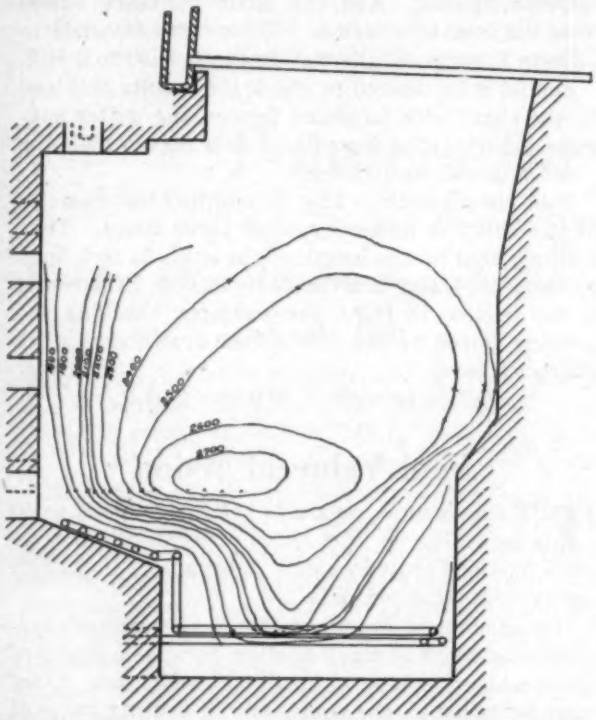
The table below is an approximation of the number of cords of seasoned wood of various kinds needed to give the same amount of heat as a ton of coal, on the basis of 80 cubic feet of wood, with a moisture content of 15-20 per cent to the cord:

1 cord	Hickory, ash, oak, elm, beech, locust, birch, long-leaf pine, hard maple, cherry	= 1 ton coal
1½ cords	Shortleaf pine, Douglas fir, western hemlock, sycamore, red gum, soft maple	= 1 ton coal
2 cords	Cedar, cypress, redwood, basswood, poplar, spruce, catalpa, white pine	= 1 ton coal

Boiler Furnace Temperature

HERE is a diagram that interested me greatly. It is taken from bulletin No. 223 of the Bureau of Mines, entitled "An Investigation of Powdered Coal as Fuel for Power Plant Boilers," by Mr. Henry Kreisinger, John Blizard, C. E. Augustine and B. J. Cross. The wavy lines within the furnace show the temperatures at different points within the different zones in the furnace. Thus the inner elliptical curve shows that the maximum temperature obtained in the furnace was 2700 deg. F., and that the volume of gas

whose temperature was 2700 deg. was relatively small. Surrounding that is shown a temperature curve of 2600 deg., then a much larger volume of



2500 degrees, and so on until we reach points close to the walls where the temperature was only 1500 deg. F. The small crosses indicate the points at which the temperatures were measured, making it possible to draw the curves as shown.

The carbon dioxide content of the gas was about 15 per cent while each set of temperatures was measured. As stated in the bulletin: "It is important to note that the flame does begin to cool fairly early in its path and is therefore radiating heat to the coil beneath it, the tubes above it, and to the cooler parts of the flame in front of the furnace."

This demonstrates why grates, soot cleaner elements, brick work, etc., placed within furnaces close to the walls or in other protected positions do not burn up more quickly than they do. If placed within the 2700 deg. temperature zone, their life would be indeed short.

Bribing the Engineer

BRIBING the engineer is a practice that is rapidly slipping away, as it justly should. The method of selling engineering supplies by enriching the engineer with a gift of $5, $50, or even $100, is not a moral method. The man who has to "buy the buyer" cannot sell goods of as high quality as can the man who does a "straight" business.

"Gifts" were excused in days gone by as "expressions of appreciation" or "friendship gifts" from a salesman to a buyer; but at the same time, both knew well that if a competing salesman would offer a higher cash reward, the competitor would get the business. Neither the salesman nor the buyer had a clear conscience, and as long as one's conscience creaks, you can be sure there is something wrong in the business method. The proper kind of business, always, is the one that can be done entirely in the open, with all figures and materials exposed, leaving a clear conscience.

An old and experienced salesman told me recently of a large institution whose former engineer was known far and wide as one who needed liberal "oiling." It was the belief of this engineer that by looking after the interests of "No. 1" first he was bound to come out ahead. As a result, the materials he purchased were not the best. The manufacturers of the leading products could not undersell those who were liberal with gifts of gold pieces and they refused to stoop to questionable practices. The efficiency of the engineer's plant, therefore, was never improved, but, on the contrary, became worse.

After a time the owners realized that there was "something wrong somewhere" and they investigated. The wondered why "such and such a thing" wasn't used "there and there," and the only explanation the engineer could give was that he got the substitute at a lower price. However, investigations of the right kind don't merely feel around on the surface. The owners got down under the surface and learned of a few of the various "oilings" the engineer had received, and in a short time they saw fit to bid the engineer good-bye.

The new engineer in this institution has virtually rebuilt the power plant from top to bottom. He is absolutely straightforward in his methods and he finds that it pays him well, for his yearly salary is not only in four figures—it runs into the five figures. The owners state that they can afford to pay an honest engineer a good salary, because if he is even halfway honest, he can save more than that for them in six months.

Picking a Good Leader

If a paper mill has no adequate inspection system, the efficiency of new help cannot be materially increased. However, if the workers can be inspired with the idea that they owe something to their craft and its standards, and to the company employing them, their efficiency can be materially increased.

The personality of the executive directly in charge of the workers today either has a great deal to do with the increasing of the efficiency of the workers, or he produces exactly the opposite results. A superintendent should endeavor to discover men in his organization who are ambitious to advance themselves. These men should then be prepared for the responsibility of positions of leadership.

Cost and Factory Accounting—Part IX

By H. M. GRASSELT
American Writing Paper Company

IN A PRECEDING chapter, standardization of furnishes and the preparatory processes of standardized beating operations and proper Jordaning have been pointed out as indispensable prerequisites to uniform paper and maximum production. Co-ordination of beater room and machine room activities, adequate paper machines and auxiliary equipment, and last, but not least, an efficient and loyal crew for the execution of the work are the other factors in obtaining the results in view.

Since there are always possibilities for improvements and chances to beat previous records, a well-trained paper machine organization and effective supervision can achieve very much toward making the enterprise more successful and at the same time insure for themselves steady employment at liberal wages.

There is, for instance, the question of the matter of increased production—an objective vitally necessary to attain in order to meet competition successfully. The desired results in view may be materialized by 1—judicious increase in the speed of the paper machine; 2—utilization of its full width, that is, using the widest possible deckel, and 3—methodical planning of runs.

Study of machine speed and, if possible, resultant adjustments and changes in drives and gears, will effect higher production. Experiments along the line will eventually disclose what maximum speed may be assumed without impairment to the quality of the paper. The next step is the establishment of definite speed standards for certain grades and weights of paper, determination of the greatest output per operating hour and putting the results into effect as standards.

The second factor—the widest possible deckel—is contingent upon the efforts of the sales department and its policies. A mill that handles just regular standard stock lines and mill brands will, no doubt, experience fewer difficulties in utilizing the full width of its paper machines than a plant that makes to a large extent, or even exclusively, special orders and cannot always run a side sheet as a filler. A narrow deckel is certainly not a profit producer. Equally important is to make the grade of paper the machines are best adapted for. That remark may at the first glance look like the feeble-minded brainchild of a fantastic theorist. It is nevertheless true that there exist a few mills that manufacture, among others, various grades which are entirely unsuited to their equipment, location and sales possibilities and consequently greatly reduce their earning capacity.

Methodical planning and laying-out of orders—the third factor—reduce the number and length of shutdowns. To plan the runs as far ahead as possible further provides an absolute control of the sequence

Date:..... DAILY MACHINE RECORD—MACHINE No.....

Tour	Prod. Order	GRADE			Basis of Weight	Size	Ream Weight	Width of Roll or Sheet	Deckel	Speed	Tub Sized Kind and %	TIME RECORD			Operating Hours	Delayed Time	PRODUCTION		Lbs. per Hr.	Mach. Broke Recov.
		Name	Water-Mark	Color								Start	Stop	Elaps.			Lot or Load	Pounds		
1																				
2																				
3																				

Figure 11

of production and prevents many aggravating and expensive slips, such as disappointing a customer, interruption of operations an account of not having some of the required raw materials on hand or prepared, and so forth. It is obvious that the longest continuous runs are always the most economical and profitable ones. Hence, all orders for a particular grade and color must be consolidated and run on one production order.

The records covering the paper machine activities should represent a complete and comprehensive history of all operations, so that an accurate control of

DAILY REPORT OF LOFT WEIGHTS

Production Order No..... Date.....

Date Made:..... Machine No..... Lbs. Made:.....

Grade:..... Watermark:..... Color:.....

Size and Weight:.....

Load No.	Actual Loft Wt.	Load No.	Actual Loft Wt.	Load No.	Actual Loft Wt.
1		8		15	
2		9		16	
3		10		17	
4		11		18	
5		12		19	
6		13		20	
7		14		21	

Total Loads:..... Total Weight:.....lbs.

No. Employed:..... Remarks:.....

Total Hours:..... .....

Figure 12

cost and production may be effectively exercised. A definite, predetermined standard production rate, as outlined in a former installment, is absolutely necessary for effective production control. Furthermore, predetermined standard cost rates are based on those production standards and it is, therefore, of greatest importance to have a means of checking the actual results against the standard rates. If, for instance, that standard production rate for a certain grade of paper is 800 lbs. an operating hour, the actual production should be at least 800 lbs., so that the cost standard may be maintained.

Two forms are sufficient to effectively cover the paper machine activities, viz., the Production Order (Figure 6a, page 1041 in the September, 1924, issue) and a Daily Machine Record, a form similar to Figure 11, herein illustrated.

To the Production Order, Figure 6a, should be added that the superintendent should state his instructions as to deckel, grain, diameter of rolls, tub size and other details about the requirements for the paper to be made on that particular run, in the space under the caption, Machine Directions. It has been found very practical to use the equivalent folio weight for each particular size and weight, irrespective of the grade of paper, instead of using the customary basic weight for the respective individual lines, such as book paper, covers, etc. To enter consistently, just one equivalent basic weight in the Production Order under the caption, Basis Weight, for all grades of paper, simplifies matters and eliminates misinterpretations by the machine help. The Production Order itself is to be made out in the office by the order clerk.

The simple arrangement of the Daily Machine Record, Figure 11, is easily understood. The machine tender transcribes the information required for the columns, Production Order to Deckel respectively from the production order form, which he has received from the superintendent. He will also obtain from the size maker or superintendent the kind of tub size solution and its strength in degrees Baumé and enter these details into the column provided for that purpose. (The procedure of calculating the quantity of tub sizing used on a particular production order will be explained subsequently.)

Under the caption, Time Record, the actual operating time of the paper machine is to be entered. The starting point is the time the stuff begins to flow over the screens and the stopping point the time the traps are closed and the stuff ceases to flow on the screens.

Delayed Time represents all time during which the machine was not actually producing paper. The causes for delayed time have to be stated on the next vacant line. Operating time and delayed time must, of course, equal twenty-four hours for two or three tours respectively, whatever the working arrangements may be.

The column, Set or Load, refers to the number of the set of rolls or loads of rough paper for the loft respectively. It need not be emphasized, that the weight of rough paper recorded under the caption, Pounds, has to be absolutely correct. To insure the end in view, the scales in the machine room should be tested every morning. Scales in paper machines require continual special attention on account of the temperature in that department. In that connection, a few words should be said about beam scales or other scales that are used by the machine tender for the purpose of determining the correct basic weight of the paper on the machine. These scales are rather sensitive to influences of moisture and heat and should be enclosed, with proper light arrangements for reading the results. It is, further, very important to cut the weight samples to absolutely true size. A frayed edge or any other slight deviation from the true size will result in incorrect weight indications. It is obvious that in weighing of samples. even the smallest fraction of an ounce over or under the required weight will effect the final results. If the paper is too light—that is, more than the permitted 2½ per cent below the nominal weight—the customer very likely will lodge a complaint or even reject the paper. The very same may occur if the

paper is too heavy. In this case, the manufacturer also gives away a few pounds of paper wth every ream he sells. Hence, why not save the perfectly good stuff for a more profitable purpose and keep the actual weight as close as possible to the nominal weight? Proper attention to weighing and cutting of machine samples will eliminate over or underweight and complaints from customers.

In loft dried mills, the weight of the production to enter under the caption, Pounds, is, of course, estimated by means of measuring the individual loads. The actual dry weight is derived from the Daily Report of Loft Weights, Figure 12, after the paper has been taken from the lofts and prepared for subsequent finishing room operations.

The column, Lbs. per Hr., may be filled out in the cost department for the purpose of checking the actual results against the predetermined standard production rate.

The caption, Machine Broke Recovered, refers to the quantity of broke from a certain run on hand after its completion. Wet or dry broke made during a run and put back into the beaters to be used in the very same run, is not to be recorded in the Machine Report. The total value of the recovered ma-

PAPER MACHINE			Cost to Tub Size	LOFT			Net Cost of Rough Paper	Net Cost of Furnish
Date	Mch. Hrs.	Cost		Hrs.	Wt. of Rough Paper made	Cost		
Totals								

Cost per 100 lbs. of Net Rough Paper Produced			Rough Paper Inventory			Machine Broke Recovered	
Net Furnish			Made	Date	Finished	Weight	Value
Paper Machine							
Loft Dried							
Conversion							
Total Cost							
Pounds of Paper per Machine Hour:			Gross Production:.....				...lbs.
			Broke Recovered:.....				...lbs.
			Net Production:.....				...lbs.

Figure 6d, Rough Production Order

chine broke is to be credited to that specific run and debited to the Paper Raw Stock account.

Form No. 11, Daily Machine Record, should be kept in a binder to keep the sheets clean. The sheet covering a period of 24 hours and filled out as explained, has to be submitted to the cost department where the various details are entered into the Rough Production Order form, Figure 6d. This form is required for the determining of the cost of an individual production order. It is of greatest importance for the procurement of actual manufacturing costs of individual runs and grades. The results exhibited by that form indicate whether certain grades can be made profitably and how the actual results compare tc the predetermined standards. Causes and reasons for lower results should be investigated at once and all detrimental conditions eliminated.

Figure 6d, Rough Production Order, is the lower part of copy four of the Production Order, Figure 6a. This arrangement is especially practicable since its upper part contains all details as to grade of paper, size, weight, etc., and eliminates transcribing of these data onto a separate form.

Completed individual Rough Production Orders are to be summarized at the end of a cost period in a Summary of Cost of Machining and Drying. This form, which is the last one required for Rough Paper Department cost data, will be briefly described in a future issue in connection with the subject of Lost Time and other essential details pertaining to securement of correct costs of rough paper.

We're 27 Per Cent Better Off

DURING the summer of 1924, wages in twenty-three leading industries were 12 per cent higher than in the summer of 1914. Of these twenty-three industries, the wages paid in the building and mining industries are still above the peak of 1920. All others have receded somewhat since 1920. The research covering these facts was carried on by the National Industrial Conference Board.

Speaking in terms of specific industries, the wage scales are as follows:

	Per Cent Over 1914 Scale
Automotive industry	122
Steel industry	141
Leather industry	125
Rubber industry	158
Textile industry	166
Anthracite coal mining	191
Railroads	135
Agriculture	89
Building trades (not counting prevailing bonuses)	108

The report further points out that some of the large manufacturing plants show an increase of 12 per cent in employment this year over 1914, in spite of the fact that this summer's employment (in the same plants) was 25 per cent below the 1920 peak.

According to this source, the wage earner is 27 per cent better off now than in 1914—that notwithstanding the increases in living costs his wages will buy 27 per cent more than they did in 1914.

Editorial Comment

By WILLIAM SIBLEY

Looking Toward 1925

OUR recent presidential elections definitely settled any September or October doubts regarding the character of our government for the ensuing four years. And the recent industrial reaction to this settlement has proven the nation-wide faith in conservative principles.

Ordinarily presidential elections do not materially effect business conditions. In every presidential year since 1880 (save 1920) the industrial trend continued upward or downward unaffected by the period of election. In five instances business was subnormal; five when it was abnormal. This year, however, the political situation did affect business conditions. And adversely so, until about October 15th, when the results of the impending election were fairly definitely assured. We know of several large contracts that were purposely held up until election returns were either assured or "in." Business in general wanted to be sure that socialism would not tie the country into a knot before going ahead with ordinary buying and commercial activity. Having that assurance, we are now tightening our belts and taking stock for a period of sound, healthy, progress.

That we are justified in so preparing for good business, no one doubts. We know of no time when our industrial stage was better set. At no time in history has the United States been better prepared to play the leading role. Seldom has the economic horizon been so free from clouds. Viewing our condition from any angle—from Babson's charts to the bankbook of the Iowa farmer—no sounder basis for optimism can be found in the past fifty years. Nor is there any indication that our period of industrial health will be shortlived. Taken sanely and without undue expansion or inflation, the prosperity that is now ours should extend over a period of years.

Practically every field of endeavor is providing us with reasons for confidence and optimism. Far reaching advances made in every industry afford the thought of permanence to prosperity. A baker's dozen new arts and a score of more new industries will be created and developed during the next few years. Health conditions will be bettered and the span of life lengthened. We will find ways to reduce our labor turnover and will apply old materials in a hundred different ways. The seasonal factor, now endured in the building and mining trades, will be eliminated and our production costs lowered.

These and a multitude of other facts make it the height of folly to consider our era of prosperity as a temporary fluctuation. Too many factors are contributing to our good industrial health to permit of the belief that a reaction will soon set in.

Our financial structure, for instance, is now solidly placed on the bed rock of knowledge and sanity. A recurrence of a 1907 money panic is impossible. There need be no periods of depression, hysterical booms or unwarranted inflation. As we have developed means for controlling our machines, so have we made progress in learning how to control ourselves.

Have you noticed, in recent months, the unusual number of yellow-back Treasury certificates that are in circulation? The reason for this lies with the Federal Reserve Banking Board—and is:

During the past three years more than $800,000,000 in gold has been imported into the United States. In the 24 months preceding October 1, 1924, our gold stock increased approximately $675,000,000. But very little of it went into the Federal Reserve Banks. None of it went into the vaults of the Treasury. Rather, it was literally pumped, by the Federal Reserve Banks, into the pockets of the people and into the small commercial banks. Simultaneously Federal Reserve Notes were retired as they were turned in. This retirement of Federal Reserve Notes prevented an undue increase in currency circulation, despite the enormous gold importation. In the two years cited our per capita circulation has increased only from $41.00 to $42.50. Had this skilled method for stabilizing currency circulation not been employed our total per capita circulation would have increased from $41.00 to over $50.00, which would have caused an abnormal increase in commodity prices and probably unhealthy speculation both in and out of the stock market.

Performance of this sort gives rise to no pessimism concerning our own stability. It is our belief (in spite of history which shows us 25 or 30 year periods of declining commodity prices after the Napoleonic Wars in 1812 and after the Civil War) that the individual or company who buys now—and forgets to sell—will be the best rewarded in years to come.

Industry is full of people who put off building a new addition—who hesitate to install a new system—who delay the stocking of raw material—because they think "the time is not ripe." It remains for the Astors to buy farms on Manhattan Island, the Fords who continue to build new plants, the Carnegies who add new units, the Hills who push their rails northwestward, the Rockefellers who dig new holes, to teach us that confidence and faith in the future of the United States pays dividends.

There are times, of course, when individual plant extension, or specific action, is not propitious. But in the long run we lose more than we gain by being fearful of the morrow.

Nineteen twenty-five and the following years hold much for all of us. The coming year will probably bring downward wage adjustments in the railroad field and upward wage adjustments in the postal service. Nineteen twenty-five will bring forward many far-reaching developments of a mechanical nature, many interesting things of an educational character—and much industrial prosperity.

—— on Timely Subjects

Trade Secrecy

IN A recent trade dispatch there appeared: "A secret formula for making dye by a method said to require only a fraction of the usual cost has been carried to the grave by a London pauper, Robert Culver, who learned it from a German relative years ago, when he brought it to England, where he organized a dye manufacturing concern. The concern, however, failed through dishonesty of some of its officials and Culver was reduced to poverty. He died recently in the poorhouse without telling anyone of the process."

Of the value of the secret in question, we know nothing. The instance serves, however, as an opportunity to again emphasize that secrecy in industrial, commercial or scientific work belongs to the dark ages—that it has no place in modern affairs.

There still live those who jealously guard all the minute details of any formula or process or method they have discovered in their particular work. There are, in all industries, manufacturers, large or small, who are often given to undue trade secrecy. Some will hardly permit a visitor to their plants for fear a bit of knowledge regarding their processes or methods might be disseminated. As for allowing the entrance of a camera! Such is not to be dreamed of. Very bluntly and frankly speaking, this is simon-pure narrow-mindedness. As a matter of fact, the "secrets" so jealously guarded by plant owners and superintendents are not such secrets as those owners and superintendents imagine. All a competitor has to do to gain complete knowledge of another's processes or methods is to release a trusted employe for work in the competitor's plant, through whom the information is gained, accurately and in full.

One of the reasons why the automobile industry has made such great strides toward quantity and economical production, in such short time, is because trade secrecy in the automotive industry is almost unknown. It is not difficult to gain entrance to any of Ford's plants. His methods and his processes are open to any legitimate investigator. Westinghouse or General Electric welcome writers or research men. Yet they don't seem to be suffering financially or morally because thereof.

A good idea, like anything else, grows stale and deteriorates through lack of ventilation. Plant your ideas like flowers—where your neighbors can see them.

What Is Being Accomplished in Other Fields

ONE engineer has found a way to substitute a single apparatus for a dozen or more of the present type of radio aerials. This not only means the elimination of the vast mileage of copper wire aerials now employed, but in the very near future all new apartments and all hotels will have a universal aerial from which a lead will be brought into every apartment or into every room.

The state college of Kansas has incorporated in their curricula a course on radio. In a few years every college and university will have a radio course.

In 1789 the span of life was about 36 years. Today it is 55. It is not a dream to say that by 1950 it will be 65 years.

In Washington they have found a way to positively control the blossoming or seeding of a plant. In one experiment with a common garden variety of radish, which plant was subjected to electric light at night as well as sun light during the day, the radish continued to grow at its normal, rapid rate for over a year. The result was a crisp, well flavored radish, as large as a sweet potato. As soon as the night light was turned off the plant seeded and ceased growth.

Artificial silk is now made from spruce wood. Nontarnishing silver is here. Waste slate is now being pulverized and incorporated into rubber to provide greater wearing qualities for boots, rubber heels, tires, etc. A new process for fusing old and new rubber does away with vulcanizing cement. By a comparatively simple chemical and heat-treatment process, they are now producing gold from quicksilver. A new method of pouring concrete permits house construction that is superior to, yet 20 per cent cheaper than brick construction. The first insulated house to be heated with gas was recently advertised in Rochester. Perfection of this principle spells revolution to domestic heating and an end to the criminal waste involved in burning coal raw—at least so far as domestic use is concerned.

The outer skin of a shark is now dried and used by cabinet makers for polishing hardwood or ivory. (The writer is going to get a piece for his head.) The inner skin of the shark lends itself admirably to the manufacture of waterproof bags, belts, purses, etc. The eyes of a shark, when treated chemically, make beautiful ornaments for jewelry. Most of the so-called cod-liver oil sold is, in reality, shark-liver oil.

Next month we will tell you of some of the things that are not yet actually facts but which may be expected—soon.

It Depends Upon Our Viewpoint

WALKING down Michigan Boulevard the other day we couldn't help hearing the conversation of two fashionably dressed, and overly groomed ladies. One of them said: "Oh, the ennui and unending monotony of life! Nothing to do—no place to go." Whereupon the other replied: "Yes—a week ago I was in Palm Beach and the tedium of the place nearly drove me crazy. Just nothing to do."

Turning the corner, we almost collided with a little, old, and wrinkled lady, whose dress instantly stamped her as being a member of the Poverty Circle. Her face shown with happiness and her eyes were alight with the joy of being alive. From a crumpled paper bag she was feeding crumbs to the pigeons.

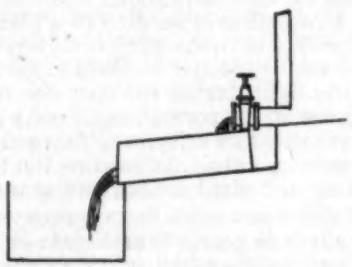
Practical Helps for the Mill Man

Doctor Used on Stretch Roll

WHERE there is a scarcity of fresh water, a considerable saving has been made by using a doctor instead of a shower on the wire stretch roll, where there are no trays above this section. A sufficient amount of water from the table rolls falls on the stretch roll to keep it clean if it is taken off with a doctor. In this way a shower is made unnecessary, which means a saving in fresh water and preventing unnecessary dilution of the white water, making a further saving in stock by decreasing the white water overflow to the sewer.

Open Drains for Blowpits

PLACING an open trough to carry away the waste liquor draining from sulphite blowpits, has been a help in at least one instance. Any difficulty in draining, or hole in the



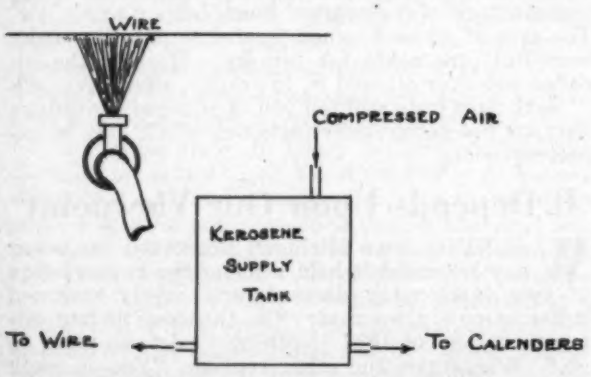
bottom allowing stock to go through, shows up immediately and is easily seen. If any trouble with the valve occurs, or if for any reason it becomes plugged, this is quickly noticed and is more accessible than if connected to a pipe.

Drying Hand Samples

IN ONE instance where it is necessary to dry a large number of hand samples, a Paragon blue print dryer has been used to good advantage. This consists of an electrically heated cylinder equipped with a felt to hold the sheets against it. The cylinder rotates slowly, being driven by a small motor.

Kerosene Shower for Cleaning Wire

A KEROSENE shower which sprays the under side of the wire while the machine is running has saved much time and trouble in cleaning the wire. Where formerly it was often necessary to shut the machine down three or four times



during the day to clean the wire, this is now very easily done while the machine is running. The shower is attached to the end of a hose and is carried in a slotted 1½-inch pipe, so that it may be moved across the width of the machine. The kerosene supply tank is located in the basement and is connected at the top with a compressed air line, so that it is always under sufficient pressure to furnish a good stream out of the nozzle.

Used Also for Spraying Calenders

Another extension goes from the supply tank to the calenders. Instead of throwing on kerosene from a pail before threading the paper through, it is now turned on through a small Powell Blow Gun attached to the end of the hose. Pressing a button turns on the small stream of kerosene. Besides being much more convenient, this saves a considerable amount of kerosene.

Calipering Rolls

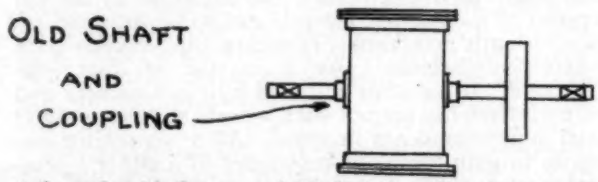
IN MENTIONING the importance of keeping all the rolls on the paper machine in perfect condition, one of our friends tells of the importance of using calipers. Where a steel tape is used, as is often the case, it is impossible to obtain an accuracy greater than 6/1000 of an inch which might not show up imperfections that might make wet spots in the paper. By using calipers, an accuracy as great as ½ of 1-1000 of an inch can be obtained. They are particularly useful in checking up newly ground rolls, especially in many of the smaller mills where this work is done outside.

Variable Speed Motor for Acid Plant

IN A sulphite acid plant, using the milk of lime absorption system, changes in cooking and other conditions often required many changes in the quantity of acid made and also in the strength. As this is controlled largely by the capacity of the vacuum pumps, it is necessary that this be easily changed as desired. This has been accomplished by installing a variable speed motor, so that the pump can run at any speed desired in a comparatively wide range.

Mixer for Digester Cement

INSTEAD of mixing the quartz, cement and litharge on the job as it is used, much time has been saved with a home-made mixer. A section of a 12-inch riveted pipe was closed

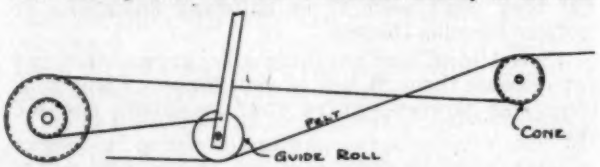


at the ends with flanges and fitted at the sides with two old couplings attached to shafts as shown.

It is placed where it may be driven from a convenient line shaft. It is partly filled with the ingredients and left to run as long as is desired. In this way, a large supply can be prepared during spare time that is all ready for use and does not have to be mixed on the job.

Guide for Dryer Felt

WHERE the automatic cone guide is used for dryer felts on wide machines, difficulty is sometimes experienced when the rope from the cone is attached directly to the arm

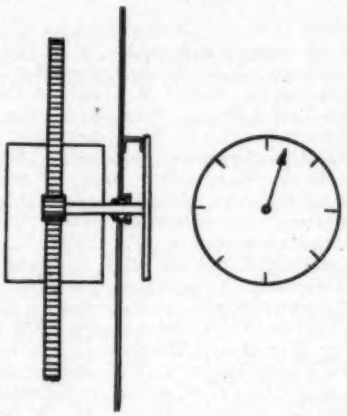


carrying the guide roll. Often the pull of the felt on the cone is either not strong enough to move the guide roll at all or the action does not take effect as quickly as it should.

To overcome this, a simple device consisting of two pulleys has been patented. The rope from the cone is attached to the larger pulley, and the rope from the guide roll bracket to the smaller pulley. This gives a leverage to the pull, exerted by the felt running up on the cone so that a slight pull on the cone easily moves the guide roll.

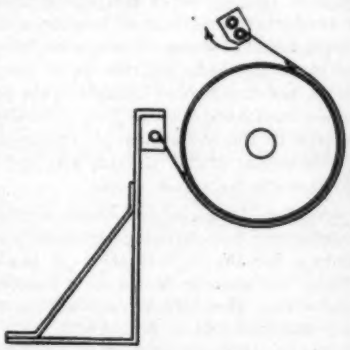
Measuring Rosin Size

THE PROBLEM of accurately measuring out rosin size from a large tank was confronted in one mill where there was not room enough to conveniently install a small measuring tank above the beaters. Owing to the large diameter of the tank, it was impossible to read the gauge as closely as was desired. A device for obtaining an accurate reading was installed as shown. A gear attached to a large float turns the pinion attached to the shaft. The shaft is attached to the pointer on a dial which is about eighteen inches in diameter. With this combination a fall of one inch in the tank makes a change of four inches on the dial at the end of the pointer. The tank is emptied to the approximate level as shown by the gauge glass and then to the desired level as indicated by the pointer.



Brake for Dryer Sections

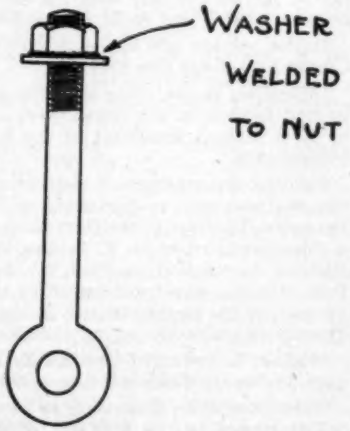
MANY TIMES, when a section of dryers is shut down when trouble occurs, it is desirable to save time by stopping it as quickly as possible after throwing out the clutch. In the sketch is shown a home-made brake made by attaching a 24-inch pulley with a 10-inch face to the drive shaft. The brake is made by attaching a piece of belting to a strip of sheet iron. It is operated by a lever on the front side of the ma-chine.



Bolting on Digester Cover

BOLTING the cover on the digester is usually an operation that is performed as quickly as possible, both to save time between cooks, and because there are often acid fumes in the air just after filling, making it disagreeable.

By welding the washer on the nut, as shown in the drawing, the bolts are easily and quickly thrown in place without bothering to hold the washer so that it clears the cover. The digester helpers will appreciate not having to fuss with a loose washer when they are in a hurry.



Trouble on Pasting Machine Corrected

TROUBLE on a machine, pasting layers of paper to build up the card board, often resulted when the paste was forced out at the edges and dropped on the dryer felt in small lumps. The dryer felt was removed and in its place a strip of canvas, about six inches wide, was placed at the edge to carry the sheet through the dryers. Now any lumps of paste that drop off, go on the floor and do not get in the felt and on the dryers.

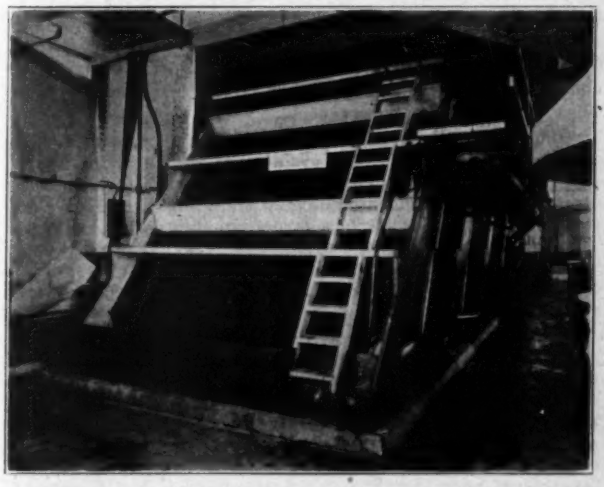
New Method for Washing Book and News Fibers

By W. J. GARDING

THERE has recently been developed in this mill a method for deinking book papers that has proven very efficient as well as effecting a decrease in the cost of production. The stock was formerly deinked by the use of drum type washers, which required considerable power and labor and the product was not thoroughly clean.

Since the new washer system has been in operation, the production has increased 13 per cent with a decrease in horsepower consumption of 83 per cent. The washed fibre is almost white in color and much cleaner than that produced by the drum washers and the necessity of bleaching with its attendant objectionable features is eliminated.

By the old method the stock was cooked from 2 to 3 hours and then washed and bleached in the drum washers, the maximum output being about 20 tons per 24 hours. With the new



washer a production of 23 tons of book stock and 70 tons of news stock per day has been attained, with the possibility of a greater tonnage due to inadequate cooker capacity. With adequate cooking facilities to supply sufficient stock to operate the washers at capacity, the production can be increased 46 per cent over the old method.

The washer is based on the inclined screen principle in conjunction with the De Zurik Nozzle Shower Spray. The washer system consists of four units each having three screens built at an angle to cause the stock to flow over them readily by gravity. The water stock is pumped into a head box over the top screen. From this it flows over the first screen to a mixing box at the head of the second screen. The fibre is thoroughly agitated and washed by the sprays in the mixing box, after which it passes over the second screen to another mixing box and then over the third screen to the stock chest. The water which drains from the fibre as it passes over the third or lower screen is returned to the stock chest, the drainage from the two upper screens going to the sewer. The four units occupy a total floor space of 36 feet long and 12 feet wide or 432 sq ft., which is approximately one-fourth of the area covered by the old type washers.

The fibre is not subject to severe treatment at any time and the loss of fibre through the wire is very small, due to the absence of forceful action upon it while passing over the wire. The stock passes over the washer by gravity, which is where the saving in power is effected.

The washer operates at its highest efficiency when the stock is supplied at a consistency of 170 lbs. per 1,000 gal., black water loss being about the same as by the old method.

National Conference on Utilization of Forest Products

THE first annual conference on the Utilization of National Forest Products, called by the late Secretary Wallace, of the United States Department of Agriculture to consider the elimination of wood waste, was held in the auditorium of the National Museum, Washington, D. C., November 19 and 20.

The conference was opened by an address by President Coolidge, followed by Acting Secretary Howard M. Gore, of the Department of Agriculture, and Col. W. B. Greely, Chief of the Forest Service.

The conference opened with a sweeping program for the conservation of the timber resources of this country which its leaders said they hoped would point the way to measures providing for saving of more than one-third of the tremendous wastage now taking place in this industry every year.

An outgrowth of a proposal sponsored by the research section of the Forest Service at the request of Carlyle P. Winslow, the conference was called by the late Secretary Wallace and Chief Forester Greeley.

The president told his hearers that the nation must act to bridge the fatal gap between lumber cut and lumber growth and that the country must, consequently, adjust itself without delay to a per capita consumption.

"This conference has been called for the purpose of further attempting to deal with the problem of our national timber supply," said the president. "One of the chief items in that problem is the present appalling waste. Some of this waste may be unavoidable, but to a large extent it is unnecessary. The time is at hand when our country is actually confronted with a timber shortage that can be remedied in only two ways: by diminishing the present waste and increasing the present supply.

"Strange as it may seem, the American people, bred for many generations to forest life, drawing no small measure of their wealth from the forest, have not yet acquired the sense of timber as a crop. These immense stretches of cut-over land, mostly too rough or too sterile for tilling, have not awakened us to their vast potential worth as growers of wood. Fully one-fourth of our land area ought to be kept in forest—not poor, dwindling thickets of scrub, but forests of trees fit for bridges and houses and ships."

"We hold the resources of our country as a trust. They ought to be used for the benefit of the present generation but they ought neither to be wasted nor destroyed. The generations to come also have a vested interest in them. They ought to be administered for the benefit of the public. No monopoly should be permitted which would result in profiteering, nor on the other hand should they be indiscriminately bestowed on those who will unwisely permit them to be dissipated. These great natural resources must be administered for the general welfare of all the people, both for the present and for the future. There must be both use and restoration. The chief purpose of this conference is to discover policies which will, in the hands of private individuals and of public officers, tend to further advancement of this already well-defined and securely adopted principle."

Delegates to the Conference then heard Acting Secretary Gore and Col. Greeley speak of the big losses that the people of the country are suffering because of lumber destruction generally.

Committee on Permanent Organization Appointed

A committe on permanent organization, the only committee appointed by the conference, was then named, as follows: Chairman, A. C. Goodyear, president Great Southern Lumber Company; secretary, A. R. Joyce, vice-president Joyce-Watkins Company; O. E. Bradfute, president American Farm Bureau Federation; O. M. Butler, secretary American Forestry Association; E. L. Carpenter, president Shevlin-Carpenter-Clark Company; Harry B. Curtain, president National Hardwood Lumber Association; E. J. Curtis, vice-president Curtis Company; W. Z. Georgia, president National Wood Chemical Association; Elliott H. Goodwin, Chamber of Commerce of the United States; Henry S. Graves, dean of the Yale Forest School; Charles H. Herty, president Synthetic Organic Chemical Manufacturers' Association of the United States; E. C. Hole, secretary and manager of the American Lumberman; John E. Lloyd, president the William M. Lloyd Co.; B. F. Masters, chairman of the board, National Association of Box Manufacturers; Dr. John C. Merriam, president Carnegie Institution; J. Malcolm Muir, chairman reforestation committee, Associated Advertising Clubs of the World; Warren R. Roberts, chairman standardization division, American Mining Congress; C. H. Sherrill, president Sherrill Hardwood Lumber Co.; Henry W. Stokes, president American Paper and Pulp Association; E. H. Stoner, president West Pennsylvania Lumber Co.; R. Y. Stuart, commissioner of forestry, commonwealth of Pennsylvania; W. B. Swift, assistant manager purchasing department, International Harvester Co.; W. A. Thomas, president Statesville Furniture Co.; Frank C. Wisner, president National Lumber Manufacturers' Association.

This committee recommended enlargement of its membership to include every agency having to do with production, manufacture and sale of lumber and timber products; strict application of conservation now known and the development of other methods and the joint co-operation of the Government and the lumber industry in a program designed to save more than 6,000,000,000 feet of lumber annually. It was presented to the conference by Chairman Goodyear and had the endorsement of Col. Greeley and Mr. Winslow, Director of the Forest Products Laboratory.

John M. Gries, of the Department of Agriculture, told the conference that buildings in America should serve as a laboratory for the investigation of lumber utilization. He said there are two problems now needing study by the lumber industry. They are the production and the use of lumber on a production job.

Standardization of lumber for use in home construction is one of the outstanding needs of the industry at this time, he added. He declared that a constructive utilization program can be carried out only with the entire backing of the industry and Federal and State Governments.

In the opinion of Charles S. Keith, anti-trust laws of the United States are now archaic.

Difficulties in operating suitable saws to cut trees near the ground to shorten the stump were discribed in a paper read by H. S. Atkins, President of the E. C. Atkins Company, of Indianapolis.

Reciting the progress of wood preservation development by the railroads over a period of eighty-five years, Julius H. Parmelee, Director of the Bureau of Railway Economics, read a paper prepared by R. H. Ashton, President of the American Railway Association, in which Mr. Ashton declared that while they consume about one-fourth of the annual timber cut, 90 per cent of the lumber treated in the United States is utilized directly or indirectly by the carriers.

William L. Sykes, of Conifer, N. Y., advocated a protective duty on imported newsprint to aid the American industry.

There was some discussion as to the activities of the committee named on the first day of the conference. The conference was directed that this committee continue and co-operate with the control committee (the Commerce and Agricultural Departments of the Government) which will function as "the central committee on utilization of forest products."

While the following is the official program and serves to indicate the line of work laid out by the conference, there were certain necessary changes and it was not adhered to strictly. The many interesting problems as here shown gave

rise to a number of informal discussions not on the regular program. A casual perusal would indicate the very large field covered:

PROGRAM

Opening Session, 9:30 a. m., November 19

Call to order by Acting Secretary of Agriculture Howard M. Gore.

"Forest Thrift." President Coolidge.

"The Purpose of the Conference." Acting Secretary Gore.

"Industrial Co-operation." Assistant Secretary of Commerce J. Walter Drake.

"A Forest Axiom." Moving pictures. (Prepared by the Forest Products Laboratory.)

"Waste Problems." William B. Greeley, Chief of United States Forest Service.

Announcement of temporary committee on permanent organization and program.

Afternoon Session, 2:00 p. m., November 19

"Waste in Industry and Methods of Combating It." C. H. MacDowell, President, Armour Fertilizer Works.

"The Road to Better Utilization." John W. Blodgett, Chairman, Central Committee on Lumber Standards.

"Preventing Waste in Distribution." Fred H. Ludwig, Treasurer and General Manager, Merritt Lumber Yards.

"Close Utilization in New England." R. T. Fisher, Director, Harvard Forest.

"Utilization of Little-Used Species." H. Oldenburg, Weyerhaeuser Timber Company.

"Waste Problems in Southern Hardwoods." M. W. Stark, Vice-President, American Column and Lumber Company.

"Avoiding Waste by Dimension Stock." Edward Hines, President, Edward Hines Lumber Company.

"Better Design of Containers as a Means of Saving Lumber." C. Fred Yegge, President, General Box Company.

"Dimension Stock from the Standpoint of the Consumer." R. E. Brown, Fisher Body Corporation.

"Close Utilization as a Factor in Permanency of Forest Industry." A. C. Goodyear, President, Great Southern Lumber Company.

Opening Session, 9:30 a. m., November 20

"Better Utilization of Lumber in Buildings." John M. Gries, Chief of Division of Building and Housing, U. S. Department of Commerce.

"Preventing Decay Losses of Wood in Service." R. H. Aishton, President, American Railway Association.

"Prevention of Decay and Substitution of Other Species in Pulp and Paper Manufacture." D. C. Everest, Secretary and General Manager, Marathon Paper Mills Company.

"Better Utilization Through Better Machinery." H. C. Atkins, President, E. C. Atkins & Co., Inc.

"Reducing Lumber Seasoning Losses." Charles S. Keith, President, Central Coal and Coke Company.

"Logging and Mill Losses in Pacific Coast States." R. W. Vinnedge, President, North Bend Timber Company.

"Utilization from Tree to Trade." J. H. Allen, President, Sterling Lumber Company.

"Close Utilization in Lake States Hardwoods." Wm. L. Saunders, General Manager, Cummer-Diggins Company.

The future program of activities, as adopted, calls for the completion and adoption and application of lumber standards, as recommended by the central committee; development of the application of scientific principles to the problems of piling, storing and drying lumber in all its forms; wood preservation treatment; extension of use of decay prevention in pulp and pulpwood in storage; methods of arrest and prevention of decay in logs and lumber; encouragement of surveys with the idea of utilizing waste products through diversified operations; development, improvement and unifying of building codes; and improvements and economics by organized industrial units consuming forest products.

After two days of earnest consideration of the many important and valuable problems entering into lumber production and handling generally, the conference adjourned. It was the consensus of opinion that excellent results would undoubtedly follow as the result of the interchange of opinion among the 200 or more leaders in this industry who attended the conference.

A rising vote of thanks was given the late Secretary Wallace for his untiring efforts in behalf of the lumber industry and agriculture in all of its many phases.

Increasing Paper Sales Abroad*

By DR. JULIUS KLEIN

Director of the Bureau of Foreign and Domestic Commerce, Department of Commerce

AT THE present time, when manufacturers of certain commodities get together for a discussion of problems, the main topic is generally: "What can we do to increase the sale of our commodity and assure ourselves of full-time operation?" If that question were put to me by such a group I would naturally ask: "What are you doing to increase your sales abroad?" Too often a manufacturer will say that he is not interested in foreign markets because there is so much difficulty involved in making a sale and further difficulty in getting his goods to the customer when the sale is made and, finally, the profit secured is not sufficient to justify his effort. With some manufacturers this attitude might be justifiable, but if all manufacturers adopted the same attitude this country would find itself in a very serious situation. Export trade is a balance wheel which takes up the slack when domestic demand falls off due to seasonal influence or adverse conditions at home and, when fully developed in an industry, assures producers of practically continuous operation. It is not a trade, however, which can be taken up during dull times in the domestic market and dropped again when conditions improve. It must be followed up constantly.

Value of Export Trade

This brings up the question as to what export trade is worth to your particular industry. During 1923, the value of paper and paper products exported from the United States, exclusive of printed matter, amounted to twenty-four and a half million dollars, an increase of more than one million dollars over the corresponding figure for 1922 and more than double that of 1913. The same items during the first three-quarters of 1924 accounted for nearly eighteen and a half million dollars. In volume this trade represents a total of about 140,000 tons each year or approximately two per cent of your total annual production.

If we add to this paper exports which go out in the form of printed material, the volume would be increased by about 25,000 tons with an added value of $17,874,000, as shown by the statistics covering the year 1923, an increase of 3,000 tons and one million dollars over the corresponding figures for 1922 and more than double those of 1913.

Including this item, the total exportation of paper and paper products during the first three-quarters of 1924 amounted to 119,088 tons valued at $32,680,000, as compared with 111,276 tons valued at $32,230,000 during the corresponding period of 1923. These figures show that American paper has been able to retain and even increase its pre-war sales in foreign markets during a period characterized by the most severe competition from European countries that, favored by exchange and low production costs, have been attempting to regain, at any price, markets lost to them during the World War.

Total Foreign Commerce Benefits Paper Industry

But the value of export trade does not rest solely upon what you yourselves export. There are few industrials as vitally affected by an increase in the total export trade of the United States as manufacturers of paper and paper products, for every sale abroad, of any commodity, carries with it an additional consumption of paper for correspondence, advertising literature, containers or packing, and a number of other operations in which paper in some form must be used. A substantial amount of what is ordinarily included under statistics or estimates covering domestic consumption would, on careful analysis, be found to be directly attributable to foreign commerce. No practicable method has been devised that will serve to show the actual amount of paper consumed annually from such causes or of computing the benefits derived from foreign trade through increased general prosperity, for the chain is endless, but exports of printed material are indicative of how other industries contribute in this manner.

During 1923 the total value of all commodities exported

*Address delivered at a paper manufacturers' luncheon held at the Cosmos Club, Washington, D. C., November 20, 1924.

from the United States amounted to $4,168,000,000, as compared with $3,831,000,000 during 1922. Total exports during September, 1924, were $427,000,000, the highest figure recorded during the past three and a half years. Notwithstanding this, preliminary statistics indicate that exports during October will exceed this record by approximately $100,000,000.

My only purpose in emphasizing the direct effect that the total foreign commerce of the United States has on domestic paper consumption is to indicate clearly how very closely and definitely such commerce concerns every paper manufacturer in the country and on financial considerations alone justifies their co-operation in any legitimate activity that has for its object the greater development of this trade.

The sale of paper, either at home or abroad, is so highly competitive that constant and specialized study of both the commodity and market is of primary importance. Through the developments of modern science, the paper industry includes an extraordinary diversity of products, ranging from silk stockings to car wheels, each requiring individual treatment in sales campaigns. It is obviously impossible for the Bureau of Foreign and Domestic Commerce, with such facilities as it has at its disposal, to keep the entire field at all times covered by information relative to each grade or product concerning which inquiries may be made.

Value of Commerce Bureau to American Industry

Every manufacturer of paper or paper products gives the most careful attention to the suitability of his particular product for given uses and of its adaptability to others. It is not practicable for every manufacturer, or any considerable number of them, to maintain representatives throughout the world whose duty it is to watch changing conditions in each country and report whenever the situation seems to warrant a special sales effort or warn against developments that threaten commercial stability. It is in this connection that I see the bureau's chief value to America's foreign trade, that is, through the distribution to the appropriate industry or manufacturer of timely and reliable information concerning existing conditions or developments and special circumstances that give rise to new opportunities.

The information so distributed is gathered from reports received from some one hundred representatives of the bureau assigned to forty foreign offices and from about 500 American consulates and consular offices located throughout the world. In addition to some 1,500 reports received each week by the bureau from these sources, it has available more than 400 official gazettes of other governments as well as all the more important periodicals and newspapers published abroad.

In order to handle this large amount of material to the best advantage, eliminate duplications and unimportant particulars, it has been necessary to organize the regional, technical and commodity divisions. The regional divisions, as the name implies, are groups that give their undivided attention to information of general application to some definite region such as Latin America, Europe or the Far East. Material of a technical nature, such as that relating to transportation, tariffs, or finance, are transmitted to the technical divisions and that relating to a designated article or class of articles goes to the appropriate commodity division.

To each of the last-mentioned divisions is assigned the task of keeping in close contact, both at home and abroad, with all developments pertaining to a particular commodity or group. The work of each of these divisions is under the supervision of a specialist, in most instances selected from the ranks of the industry concerned, and for this reason better able to determine the value of the material received and direct its preparation for distribution.

Bureau's Service to the Paper Industry

A distribution feature recently inaugurated by the Paper Division of special interest to the industry is a weekly news letter containing a summary of the more important events reported during the week, and which is sent automatically to a mailing list of some 600 firms. These news letters are supplemented by mimeographed bulletins issued as often as circumstances require, which contain brief discussions of current events in some definite market or competing country based on recent reports received from the territory concerned. The number of each bulletin distributed varies with the number of firms believed to be interested in the specific subject covered.

By such means the bureau endeavors to indicate to American manufacturers what markets offer the greatest possibilities and to follow such suggestions with definite co-operation at each stage of development by supplying trade lists or special reports covering importers, dealers or prospective agents, information relative to tariffs, transportation, methods of distribution, credit terms, and a variety of other data needed in a proper handling of export business. Such information is obviously of two general classes, one of which relates to the activities of competing countries and the other to conditions and developments in foreign markets.

During recent months, close attention has been given by the Paper Division to conditions existing in the paper industries of those countries which are the chief competitors of American mills in foreign markets. The bureau's representatives and American consuls, particularly in Germany, Austria, Scandinavia, and Canada, have been requested to keep constantly informed concerning the costs of raw material, labor, and other factors of production and to report on these features either periodically or as the occasion demands. Those who have followed these reports during recent months will have noted that European production costs are steadily rising and a late bulletin based on advices from Cuba shows that this tendency is being reflected in the prices quoted on European paper offered in that market. Indications are that production costs in Europe will continue to advance and it is reasonable to believe that the margin between prices quoted on the European article and those at which American mills can sell with profit will be reduced to a point where paper from the United States can compete in foreign markets on the basis of price.

The foreign commerce enjoyed by the United States today represents sound development and not inflation; has been secured under highly competitive conditions and is, therefore, permanent. History has shown and present indications are that the diversity of comparative values existing in the various countries of the world as a result of the war, will, with time, reach a level where the American product will not be handicapped by production costs excessively greater than those current in other producing countries. The existing foreign trade is on a solid foundation and each stage in this readjustment of international values, now taking place, opens up new opportunities for the greater expansion of our foreign commerce.

Application of Power to Paper Making in the United States*

By A. H. WHITE

Chief Engineer, International Paper Company

IN the United States the Paper and Wood Pulp Industry ranks fourth in amount of installed power capacity but as it is a twenty-four hour industry it ranks second in power consumed.

According to the Fourteenth Census of the United States during the year 1919, primary power was installed in the first four industries, as follows:

All industries	29,507,000 H.P.
Iron and steel, including blast furnaces and rolling mills	5,402,000 H.P.
Lumber and timber products	2,359,000 H.P.
Cotton and wool textiles	2,330,000 H.P.
Paper and wood pulp	1,851,000 H.P.

It is interesting to note the relation between power installed and capital invested, as follows:

All industries, $44,569,594,000 or 662 H. P. installed per million dollars invested.

Cotton and wool textiles, $2,735,958,000 or 852 H. P. per million dollars invested.

Iron and steel, $3,458,935,000 or 1,562 H. P. per million dollars invested.

Lumber and timber, $1,357,992,000 or 1,730 H. P. per million dollars invested.

*Abstract of paper presented at the World Power Conference, at London, in July, 1924.

Paper and wood pulp, $905,795,000 or 2,043 H. P. per million dollars invested.

It is also interesting to note the relation between power used and persons employed:

All industries had installed 3.2 H. P. per employee.

Lumber and timber had installed 4.9 H. P. per employee.

Cotton and wool textiles had installed 5.4 H. P. per employee.

Iron and stool had installed 13.0 H. P. per employee.

Paper and wood pulp had installed 16.3 H. P. per employee.

The above follows in tabulated form.

	Primary horse power installed	Capital invested $000 omitted	Horse power per $1,000,000 invested capital	Total number of employees	Horse power per employee
All U. S. industries	29,507,000	44,569,594	662	9,096,000	3.2
Iron & Steel, Inc., blast furnaces and rolling mills.	5,402,000	3,458,935	1,562	416,759	13.0
Lumber and timber products	2,359,000	1,357,992	1,730	480,950	4.9
Cotton and wool textiles	2,330,000	2,735,958	852	437,460	5.4
Paper and wood pulp	1,851,000	905,795	2,043	113,760	16.3

It is thus seen from the foregoing that the paper and wood pulp industry ranks fourth in the amount of power; that of the four industries named, it stands first in power installed in proportion to capital invested in the industry; and that it also stands first in the amount of power per employee. While the paper and wood pulp industry stands fourth as regards installed power, it stands second in consumption of power. As is the case in the iron and steel industry, pulp and paper mills run twenty-four hours per day, while lumber mills and textile mills run eight and ten hours per day.

Therefore, the paper and wood pulp industry is a highly important factor as a power user, and power is a highly important factor in the industry.

In the year 1919, 6,098,530 tons (2,000 lbs. to the ton) of paper were made in the United States. The power used was 1,851,000 H.P.-years, making 0.33 H.P.-years per ton of product.

In the paper industry, twenty-four hours constitute a day and a mill is rated on its twenty-four hour capacity. For example, a mill having a normal capacity of 200 tons in twenty-four hours is called a 200-ton mill. Power is spoken of as the rate at which power is used, that is, if we say 90 horse power per ton is required for making a certain class of paper, we mean that power is used at the rate of 90 H.P. for twenty-four hours.

The writer recognizes the fact that the use of the terms horse power hours or kilowatt hours would be better, especially as the electric transmission of power is year by year growing more prevalent in the industry.

Thus the 1,850,000 H.P. rate at which power was used during 1919 as applied to the 6,098,530 ton machine capacity per year would mean (the paper mill year in the United States being taken at 310 days—52 Sundays and 3 holidays out) 93 horse power per ton per day. This figure is not by any means accurate, as will appear.

The amount of power used per ton of paper depends, of course, upon the sort of paper made. Some papers requiring very little manipulation of stock consume relatively little power; other papers, such as those made from old rope and other stocks which are not treated chemically or by heat, consume larger quantities of power.

As papers made from wood predominate in the United States and such papers require the larger amounts of power, we may take for example the manufacture of newsprint paper.

In a well designed mill, ground wood can be produced with 80 horse power per ton, that is, 1,920 H.P.-hours, or 1,432 KWH.

In handling and manipulating the stock about 10 horse power per ton, or 240 H.P. hours, are required for each kind of stock and for the combination formed by the two before they go to the paper machines.

Roughly speaking, newsprint contains 75% of ground wood and 25% of sulphite. Thus the ton of paper requires about 1,740 H.P. hours or, as the paper maker puts it, 72½ horse power per ton.

Newsprint grade made in the year 1919 was 1,473,719 tons, or 24%, of the total production of paper. This grade of paper contains say 75% of groundwood. Groundwood is produced almost exclusively by water power and as it can be stored over long periods it is the custom to overdevelop groundwood mills, thus making use of much more than the low water flow of the streams. The statistics in the census report show installed power, therefore the rate of 93 H.P. per ton daily production as given above is high.

Since the driving of a paper machine requires only 3% to 5% of the heat units in the steam and as in most cases some live steam is required to supplement the exhaust, the efficiency of the steam engine driving the paper machine has not been of interest to the paper maker.

Efficiency of Water Wheels

For many years the paper maker and others, for that matter, did not realize the importance of efficiency in water turbines. Upon the introduction of mechanical pulp (ground wood), the importance of greater efficiency in water wheels became apparent and it has been said that groundwood manufacturers have been responsible for the great strides made by the water wheel builders in the United States. Of course, in recent years the generation of electricity has strenuously demanded more and more efficient wheels. Twenty-five years ago the paper maker was content with water wheels giving 80% efficiency. Today we ask for and get from 88 to 92%.

Use of Oil Fuel Increasing

While coal is and for many years will be the chief source of heat in paper mills, crude oil is being used more and more. Oil fuel should prove desirable when the transportation costs are not too high. This means that a mill not too remote from the seaboard can usually show a saving in fuel by the use of oil. This is especially true of mills situated long distances from the coal fields, but not remote from the coast. Aside from the calculable advantages in the use of fuel oil and the freedom from dust in coal and cinder (not good for paper) fuel oil is so much simpler to handle and transport that the mill manager is relieved of the trouble and annoyance always attendant upon the coal supply and its handling. Especially in the colder climates the introduction of fuel oil takes burdens from the shoulders of the management, leaving it free to that extent for real production.

Introduction of Electrical Transmission

Probably the greatest and most radical change in the application of power in paper making has been the introduction of the electrical transmission. Years ago paper makers began to install motors here and there for group driving and for individual drives. Gradually generators were installed in the mills and with the establishment of hydro-electric plants more and more use of electricity was made until today there are mills entirely driven by electric power. It is interesting to note in this connection that the year 1919, 31½% of the power used in paper making in the United States was transmitted electrically.

The first attempt at electrical driving was by means of direct current motors regulated in speed by individual rheostats, the speed of the machine as a whole being regulated by the Ward Leonard Control. The generators were driven by ungoverned water wheels. This method of driving was crude but by careful attention was made to work. The next trial was with induction motors with mechanical speed reduction devices between the motors and the machine shafts. This scheme proved a failure and the problem lay dormant until about six years ago, when three methods of sectionalized electric drives came upon the scene. Two of these are really elaborations and refinements of the first direct current motor plan. The third method is radically different in that direct current motors of slow speed are used, with small

synchronous motors opposed to or working with the direct current motors as the load may vary. The synchronous motors are connected by small cone pulleys and belts to the shafts of the direct current motors; thus the relative speeds are adjusted and the synchronous motors maintain the established speeds, acting as brakes or boosters as the direct current motor tends to slow down or speed up.

As was said earlier, only 3% to 5% of the heat units in the steam used in a paper machine is needed for driving the machine, 95% to 97% being used for drying the paper. Therefore, in an electrically driven machine it is economy to generate electricity by steam, using the exhaust from the turbine or engine for drying. Some mills use water power generated electrically for driving the machines and live steam for drying. At any reasonable cost of hydro-electric power this cannot be economical nor are there any advantages to be gained.

While the electric sectionalized drive has many advantages over the pulley and belt drive, these advantages are not so apparent on small, slow-moving machines such as make the heavier and finer grades of paper. Speeds of over 700 feet of paper per minute require the electric drives.

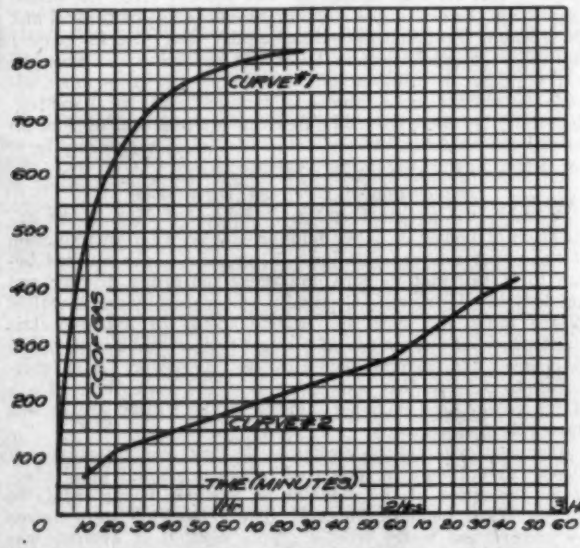
Another advance in the application of power in paper making has been made in Scandinavia and is starting in the United States, namely, the generation of steam at relatively high pressures, reducing the pressure through steam turbines for power purposes, using the exhaust for cooking stock and drying paper.

This practice, possible when large amounts of heat are required other than for power, and relatively small amounts of heat for power, will result in a low combined cost.

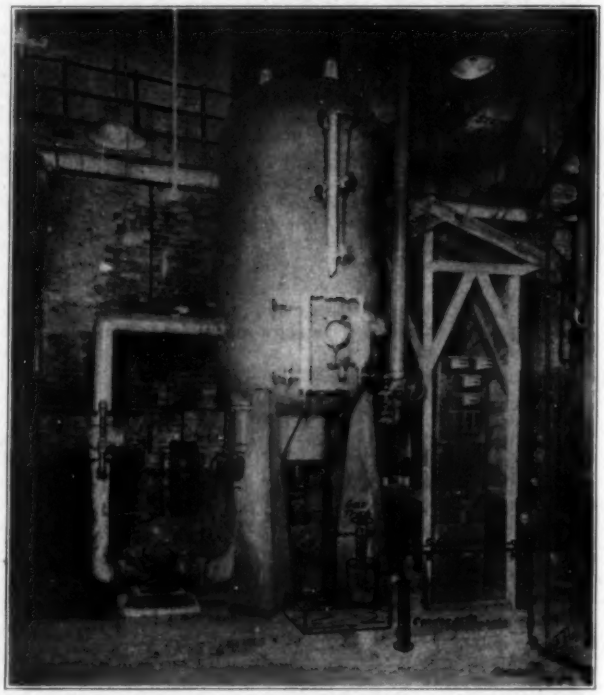
Determination of Hydrogen Produced in a G. E. Electric Steam Generator

By C. DANTSIZEN AND E. H. HORSTKOTTE
General Electric Company

IN ORDER to determine the amount of hydrogen liberated in an electric steam generator under actual operating conditions, a test was made on a unit rated 5,000 kilowatt, 3-phase, 60-cycle, 6,600 volts, operating at 100 lb. gauge, installed at the plant of the Union Bag & Paper Corp., Hudson Falls, New York.



The apparatus used in conducting this test was arranged as shows in the accompanying paragraph. It consisted of a condenser which was connected to the main steam line by a ½-in. pipe. Cooling water was supplied to the condenser and the condensate was caught and measured in a graduated container. The gas was caught in an inverted glass graduate which served as a gasometer. Before the test was started, the inverted graduate was so filled with boiled water that whatever gas was trapped at atmosphere pressure was equal in volume to the amount of water displaced. In order to make sure that no condensate from the main steam line drained back into the testing apparatus, the ½-in. steam pipe to the condenser was connected to the upper side of the



Test Equipment for Determining Hydrogen Content in Steam

steam line. It is a reasonable assumption that there is a homogenous mixture of steam hydrogen and other gases at this point. Only a portion of the steam flowing in the ½-in. line was condensed, the remainder exhausting to atmosphere. In this way only dry steam was taken into the condenser.

The first test was started at the time the generator came to normal operating pressure. During a period of 62 minutes, 790 c.c. of gas was liberated from 5,010 c.c. of condensate. During this run the average power input into the generator was 1,450-kilowatt, 3-phase, 600 cycles, 7,000 volts, 120 amperes.

The gas analysis was:
Hydrogen, 1.3%.
Oxygen, 18%.

The 790 c.c. of gas or 5,010 c.c. of condensate contained 790 × 1.3% = 10.27 c.c. of hydrogen. Or, for each cubic foot (62½ lb.) of water evaporated, .00205 cubic ft. of hydrogen was liberated.

During the tests, the temperature of the feed water was 180° F., and the pressure at which the generator operated was 100 lbs. gauge. With these conditions the total heat per pound of water evaporated, from the steam tables, is 1,010.7 B.T.U. Assuming that the generator operates at 97% efficiency, then the number of B.T.U. used per hour in evaporating water is 1,450 × 3,412 × .97 = 4,780,000 B.T.U.

$$\frac{4{,}780{,}000}{1{,}010.7} = 4{,}730 \text{ lbs. water evaporated per hour with an average power input of 1,450 kilowatt.}$$

$$\frac{4{,}730}{62.5} = 76.5 \text{ cu. ft. of water evaporated 1 hr.}$$

$76.5 \times .00205 = .157$ cu. ft. of hydrogen liberated per hour when the generator was first started with a power input of 1,450 kilowatt, 7,000 volts, 120 amps., 3-phase, 60-cycle. This is the equivalent to .00131 cu. ft. of hydrogen generated per amp. per hour.

From curve No. 1, it is seen that the rate of liberation of

gas gradually decreases. This is to be expected, as there is a considerable volume of air in the generator shell and feed water which passes out with the steam during the first hour or so of operation.

After the steam generator had been in operation several hours another test was made. During a period of two hours and 43 minutes, 407 c.c. of gas was liberated from 21,993 c.c. of condensate. During this run the average power input was 1,310 kilowatt = 7,000 volts, 108 amp., 3-phase, 60-cycle.

The gas analysis was:
Hydrogen, 4.4%.
Oxygen, 20.5%.

The 407 c.c. of gas or 21,993 c.c. of condensate contained 17.908 c.c. of hydrogen. Or for each cubic ft. (62½ lb.) of water evaporated, .000815 cu. ft. of hydrogen was liberated.

Calculating the number of cu. ft. of water evaporated per hour as before:

$$\frac{1{,}310 \times 3{,}412 \times .97}{1{,}010.7 \times 62.5} = 69.8 \text{ cu. ft. of water evaporated per hr.}$$

$69.8 \times .000815 = .05688$ cu. ft. of hydrogen liberated per hour when the generator was operating with a power plant input of 1,310 kilowatt, 7,000 volts, 108 amperes, 3-phase, 60 cycles, and after the generator had been operating long enough to eliminate the effect of the air trapped in the generator while cold. This is the equivalent to .000527 cu. ft. per ampere per hour.

Curve No. 2 indicates that the rate of evolution of the gaseous mixture is constant as long as conditions in the generator are constant. At the point 275-63, the feed water regulator operated admitting more water into the lower compartment. The rate of evolution of gas increased due to the presence of air in the added feed water. As soon as this air was removed from the generator the rate of evolution of gas was the same as before, as indicated by the slope of the curve.

By comparison of the two tests it is seen that the evolution of gas (air and hydrogen) is greater when the generator is first started, and it is also seen that the evolution of hydrogen is greater when the generator is first put into operation than it is after running several hours. After conditions become constant, the rate of generation is constant for a constant current input.

It should be noted that in either case the quantity of hydrogen liberated per hour is exceedingly low and if the generator supplies steam to a circuit in which all condensate returns to an open hot well, it is impossible to accumulate sufficient hydrogen within the generator shell to form an explosive mixture of any magnitude. If the steam generator were operating on a closed system, however, evaporating the water over and over again, and no means were provided for the removal of the hydrogen generated, then a considerable accumulation of hydrogen would take place in the generator shell, which might be ignited by an arc drawn from the electrodes and exploded.

In order to determine if there was any greater hazard in operating a heating system with steam generated by an electric steam generator compared with steam from a fuel-fired boiler, an analysis was made of the steam made in the boiler plant of the Schenectady works of the General Electric Company. Using the same apparatus, 160 c.c. of gas was trapped out of 50,000 c.c. of condensate. This gas analyzed 10% hydrogen, which is formed by the action of steam in contact with iron. This is at the rate of .0003 cu. ft. of hydrogen for each cubic foot of water evaporated.

The generator of hydrogen in an electric steam boiler will be approximately proportional to the amperes input, but whatever the current input, the same volume of hydrogen might accumulate in a heating system if it were supplied with steam from a fuel-fired boiler, it being merely a question of time. However, since no destruction of heating systems has been attributed to hydrogen from fuel-fired boilers, then it is reasonably safe to assume that the same performance might be expected with steam from an electric steam generator.

How Paterson Parchment Saves $4000 Annually

Mr. Henry Boan, Superintendent of the Finishing Department of the Paterson Parchment Paper Company, (Passaic, N. J.) tells of the economy of mechanical means over hand labor, how his labor turnover has been reduced, and the method he employs to determine effected savings.

Says Mr. Boan: "We have been using electric hoists in connection with our sheet cutting machines for over 8 years, and have found them very advantageous in spite of the fact they are used only a short time each day. There is an individual ½-ton hoist for each machine, and they are located directly over the stands for the paper rolls. These hoists have a lift of about 12 feet. Each are controlled by cords hanging conveniently in front of the rolls, and easily reached by the men working with the rolls.

The stand of each machine holds 10 rolls and a machine normally uses two sets of rolls per 9½ hours of operation. All the rolls on a machine are usually changed at the same time.

From 500 to 550 pounds is the weight of each roll. They are brought to the machines on a conveyor, and two men place them in the machines. While the roll is hanging on the conveyor a rope loop is passed around it, and the hook of the hoist cable is inserted in the end of the loop. The hoist then performs the task of raising the roll to the proper place on the stand.

The operation of the hoist is so simple that the men have no difficulty in raising the rolls rapidly and guiding them into place accurately. The rapidity with which this hoist operates reduces to a minimum the time the machines are stopped for changing rolls.

Saves Wages of Two Men

For several years prior to the installation of the Link-Belt hoists we used hand operated chain blocks. With this old method it required just about twice as long to load a machine. This meant that the labor cost was double our present expense.

Since we now use one team of two men for changing the rolls, the former method would have required at least two teams, or 4 men. Thus the hoists eliminate two men, which saving amounts to $2,660.00 a year.

An important saving is also made in the operating cost of the cutting machines, by reducing the time lost in changing rolls. This now averages less than ¾ hour per day for each machine, compared with nearly 2 hours for the chain block method. Hence, the hoists are increasing the operating time of each machine by more than one hour a day.

Costs Only $.013 Per Roll

This results in a production increase of about 13 per cent, which, estimated conservatively, saves overhead and labor charges of at least $375.00 a year per machine. As shown on the accompanying calculation, this amounts to $1,875 a year for the five machines. Adding the direct labor saving, the total becomes $4,535.00 a year.

A further advantage of this mechanical means is the

elimination of a great deal of hard manual labor. It was formerly very difficult to keep men at this work. Now, however, our labor turnover is practically nothing. The men are contented, and they do their work carefully and quickly. This advantage alone has more than justified the investment in electric hoists.

After deducting from the gross savings, the operating expenses of the five hoists, there remains a net annual saving of $4,169.60 which repays the entire investment in about 6½ months.

OPERATING COSTS:	
Depreciation: $450.00 ÷ 20 years life	$ 22.50
Average interest at 6%: $\frac{21}{20} \times \frac{\$450}{2} \times .06$	14.18
Maintenance and repairs	25.00
Power used per year, approximately 380 kw. × $.03	11.40
Total cost per year	$ 73.08
ECONOMIES EFFECTED:	
Labor eliminated through replacement of chain blocks—2 men × $1,330.00	2,660.00
Time saved per machines—1 hour. Production increased 13.3 per cent.	
Value of machine time in overhead, approximately $375—$375 × 5 machines	1,875.00
Total gross savings	$4,536.00
Cost of operation on 5 hoists—$73.08 × 5 hoists	365.40
Net annual savings effected by hoists	$4,169.60

Newsprint Possibilities in South

The possibility that the South will become a producer of newsprint paper in large quantities within a few years is suggested by the announcement of Carlile P. Winslow, Director of the U. S. Forest Products Laboratory at Madison, Wis., that this federal laboratory has under development a process for manufacturing newsprint paper from black gum, cottonwood, and other southern hardwoods.

"After two years of experimentation," said Mr. Winslow, "we have been able in the laboratory to utilize these woods by a new chemical process giving a yield of paper equivalent to 80 per cent of the weight of the wood. This is as high a yield as is obtained in the usual processes of making newsprint, which are adaptable only to spruce and a very few other softwoods.

"If the new process, which is still in an experimental stage, proves commercially feasible, it will spread the burden of the newsprint supply over a large number of woods and over new regions, particularly the South. There are now in the South large stands of second-growth hardwoods not now used to any great extent as lumber or for other purposes. These species have a fairly rapid growth, so that a continuous supply is promised the pulp mills which establish themselves in the new region. Both because its climate is the most favorable to forest growth and because it is advantageously located with respect to many paper-consuming centers, the southern hardwood region is well suited to become a permanent source of pulpwood. Heretofore the southern woods have not offered much possibility to the pulp manufacturer except for the making of unbleached kraft or wrapping paper."

The first samples of the new paper, according to Mr. Winslow, were used in the program for the National Conference on the Utilization of Forest Products held in Washington, November 19 and 20.

Research is far ahead of practice in the matter of efficient wood utilization, Mr. Winslow believes, and a leading purpose of the Washington conference is to formulate co-ordinated action by organized industry to accomplish improved practice whenever possible.

The Joint Committee on Approved Chemists for the American Paper and Pulp Association has recently approved for listing Mr. Olin W. Callighan, Allied Paper Mills, Kalamazoo, Mich., and Mr. G. P. Genberg, Fraser Companies, Ltd., Edmundston, N. B.

A New Pipe Threading Tool

The new Toledo 3-way tools for threading small pipe are claimed by the manufacturer, The Toledo Pipe Threading Machine Company, Toledo, Ohio, to be the lightest, smallest and easiest to operate of like tools.

Two sizes are made, No. 30 weighing 4¾ lbs. and cutting threads ⅜ in., ½ in. and ¾ in., and No. 31, weighing 7 lbs. and cutting threads ½ in., ¾ in. and 1 in. The tool bodies are about the size of a baseball, contain no loose parts and have no adjustments when ready for use.

The patented design of the tool body permits the use of segmental dies which are removable and can be reground when dull, or replaced at slight cost. The tool body is designed to clear itself of chips, thus preventing clogging.

The manufacturer will be glad to furnish further information on request.

A Comment

IN THE October, 1924, issue of THE PAPER INDUSTRY, there appeared in the Department "Practical Helps for the Mill Man," an item describing an inclined screen save-all.

A well known manufacturer of rotary save-alls submits the following comment:

"The inclined screen save-all is 100% better than none.

"A report from the Committee on Waste of T. A. P. P. I. shows that this 'side hill' save-all had an efficiency of 40% against the revolving type of 80% or more efficiency.

"As the stock on the 'side hill' comes wet, it means that it must be pumped at once to the chest to be used. If different colors are run, it mixes them so the result is run away down the sewer because it has no value. Wet stuff means also that the manager has no way to stop a leak. With dry stuff from a save-all, he knows that he should get 7 boxes of stock on his morning report. If he gets 8 or 12 boxes on his report in the morning, he knows that a leak has started and sees that it is stopped today. Getting wet stock means he has no tell-tale and the leak may run for one year or more.

"I believe that a revolving type of machine is a better profit producer because the dust, which will go through any wire mesh repeatedly, and grease and dirt is removed with the water and only good fibers are used and the pulp is much cleaner because it is washed in the save-all.

"I saw a mill with an $18,000.00 settling tank save-all lately. It had been paid for and not run for two weeks. The superintendent had shut it down, because the stock was so dirty with grease and floor sweepings that it was not fit to make paper. The 'side hill' type also does not remove enough pulp that the white water is clean enough to re-use on showers in most cases."—Signed R. A. N.

Pan American Conference on Standardization

The Peruvian Government has invited the twenty-one republics in the Pan American Union to a conference on standardization to be held at Lima, Peru, beginning December 23 of this year. The Conference is called by the Pan American Union at the request of the Fifth International Conference of American States which met at Santiago, Chile, in 1923. The Peruvian Government will act as host.

Sixty technical and trade organizations in this country have been invited to send representatives, and there will be representatives of similar organizations from other countries.

The general purpose of this conference will be to study the possibilities of developing inter-American and international standards for raw and finished materials as well as standardized classifications and nomenclature and to make recommendations with regard to the steps to be taken by the States looking toward the development of these objectives.

The substitution of ladders on calender stacks for the usual steps, enabling men working on the calenders to get a better footing, has been carried out in one mill as a safety measure.

Wisconsin News

December 1, 1924.

Olai Bache-Wiig Dies in South

Olai Bache-Wiig, vice-president and general manager of the Wausau Sulphate Fibre Company, and president of the Tomahawk Kraft Paper Company of Tomahawk, Wisconsin, suffered fatal injuries near Louisville, Indiana, on Tuesday, November 11th, when he was thrown from a riding horse at a health resort where he was spending a week for a rest and recuperation, and from which fall he died the same evening.

In the death of Mr. Bache-Wiig, the paper industry of the United States loses one of its foremost men, one who had developed an entirely new process of paper making, and who it was confidently expected, had only started to work out the many ideas which seemed to crowd his mind.

Mr. Bache-Wiig seemed to be a human dynamo for work and was always working at what is known as "high pressure." He was able to size up a situation in the twinkling of an eye, but that his judgment was keen is proven by his living monuments, the huge mills at Mosinee and the more recently developed company in Tomahawk, Wisconsin.

Olai Bache-Wiig, the vice president and general manager of the Wausau Sulphate Fibre Company at Mosinee, Wisconsin, the first mill in the world to make Kraft paper at the rate of one thousand feet per minute, branched out still further. Bache-Wiig in the early part of February, 1923, made up his mind that he wanted more mills even if he had to go out in the market and buy one, and this is exactly what he did. He bought from the Seaman Paper Company the physical property of the Pride Pulp and Paper Company consisting of a complete paper mill at Wisconsin Dam, Wisconsin, about two and a half miles south of the city of Tomahawk. The Pride Pulp and Paper Company of which C. B. Pride was president, produced daily 25 tons of catalog papers. It was practically a brand new mill, which was built about three years ago and contained one Moore & White Fourdrinier machine. Along with this mill, Mr. Bache-Wiig purchased two undeveloped powers on the Wisconsin river, namely, Grandmother Falls, which has a head of about twenty-three feet, and Nigger Island with a head of about forty-three feet. A new dam and power plant was built at Grandmother Falls, and both of these structures are surely fine pieces of engineering. A modern sulphate mill was built next to the paper mill. Mr. Bache-Wiig, when he bought the Pride Pulp and Paper Mill and the water powers, formed a company that incorporated under the name of the Tomahawk Kraft Paper Company. Most of the stockholders of this company were people interested in the mills of the Wausau Sulphate Fibre Company and in the Marathon Paper Mills Company of Rothschild. Other stockholders are George M. Seaman of Chicago and New York, and George K. Gibson of Chicago, selling agent of the Wausau Sulphate Fibre Company.

It is one of the hardest things in the world to keep a good, practical paper and pulp manufacturer and a successful paper mill manager from branching out, improving and increasing the production of his already successful mill, or to stop him from buying other mills and operating them.

Olai Bache-Wiig and his whole family are paper and pulp manufacturers from birth, and after Bache-Wiig had served his time in successful mills in Norway, where he started when he was a boy in 1903, he came over to this country as a trained mechanical engineer and paper maker. All he wanted was an opportunity to get into the manufacture of pulp and paper. Of course, when Mr. Bache-Wiig arrived, he found it difficult to get into a paper or pulp mill, as he was a stranger to everyone here. He finally joined the engineering department of the Manhattan Elevated Railroad Co. in New York. Before the end of the year he made a connection with the Mount Tom Sulphite Fibre Company, Mount Tom, Mass., which mill was being then operated by Russel & Springer. The product of this mill mostly all went into Holyoke to the fine writing mills.

Shortly after this he set up as construction engineer, with headquarters in Boston and undertook to improve the sulphite and increase the production of the mills of the York Haven Paper Company, York Haven, Penn., and the Laurentide Company, Ltd., Grand Mere, Quebec.

While he was doing this, he discussed with paper manufacturers the possibility of producing light-weight Kraft paper in America, which had been his hobby abroad. So successful was Mr. Bache-Wiig in this direction, that George Van Dyke, whom we called years ago the "Wood King of New England," and who also owned a soda pulp mill at East Angus, Quebec, decided to give Mr. Bache-Wiig a chance to convert this mill from a soda to a sulphate pulp mill.

Mr. Van Dyke did not give a darn whether Mr. Bache-Wiig made a success with the mill or not, for the reason that this soda mill was wished on Mr. Van Dyke and he had long been losing a barrel of money in it trying to run it. So Van Dyke said to Bache-Wiig, "I have a barrel of money sunk in that mill and I want you to get me two barrels of money out of it, if you think you can do it, anyhow, go ahead and try."

Well, Bache-Wiig went ahead and tried and succeeded in getting more than two barrels of money out of it for Mr. Van Dyke.

In January, 1907, The East Angus Paper Mills was consolidated with the Brompton Pulp and Paper Company and in August, 1907, the first cook of sulphate pulp was made on the North American continent, and in the same mill the first Kraft paper was manufactured from American-made Kraft pulp. Mr. Olai Bache-Wiig was the man who accomplished this feat.

Two years later, having completed his task, Mr. Bache-Wiig resigned and again associated himself with Mr. Van Dyke, the man who gave him practically his first start, and who wanted him to build a mill in Vermont, but before the project was started Mr. Van Dyke was killed in an automobile accident and the plans for the mill were never executed.

The following year, in 1910, the Wausau Sulphate Fibre Company was organized by Mr. Bache-Wiig. Mr. Bache-Wiig associated himself with G. D. Jones, Karl Mathie, Neal Brown and F. P. Stone. The mill was immediately constructed at Mosinee, Wisconsin, and in October, 1911, the Kraft paper was manufactured.

Three paper machines have been installed in this mill. The first machine started up in that mill was 136 inches wide and the second machine was installed in 1914 and ran 600 feet per minute. The third machine was a record breaker. In fact it made the world's record of 1,000 feet per minute.

In the meantime Mr. Bache-Wiig designed and built the sulphate mill for the Bogalusa Paper Company at Bogalusa, La., and also designed and built the sulphate mills of the Pacific Coast Mills, Ltd., at Ocean Falls, British Columbia.

In 1917, Mr. Bache-Wigg was made vice-president and general manager of the Wausau Sulphate Fibre Company, the position which he held at the time of his death.

It must be admitted that Mr. Bache-Wiig has been a very successful paper and pulp manufacturer, as well as mill manager.

Funeral services were held on Saturday afternoon, November 15th, at Mosinee, and interment took place at Wausau.

Marinette & Menominee Paper Co. Installing New Machine

The construction work at the Park Mill of the Marinette & Menominee Paper Co., at Marinette, Wisconsin, is progressing rapidly, and most of the machinery for the extension has arrived.

The Beloit Iron Works have about completed building the machine, and their erection engineer started to erect it on Monday, November 3rd.

The new machine is a 132 Yankee, and is equipped with all of the latest improvements in machine design including the removable Fourdrinier patent apron board, motor driven shake, etc. The dryer is 12' in diameter and 132" face, and is equipped with a second pressure roll. The machine is equipped with suction pumps, bird showers, and a 5-roll calender stack.

An Ames 12"x14" variable speed twin engine will drive the

variable speed end of the machine including the suction pump, fan pump and the rest of the auxiliaries, while the constant speed end will be driven by individual motors.

It is expected to have this machine in operation by the first of the year.

Cost Association Meeting

A meeting of the Cost Association of the Paper Industry was held at Green Bay, Wis., on Tuesday, November 18th, being attended by representatives from most of the mills in this division. The speaker was Mr. Thomas J. Burke, secretary-treasurer of the Cost Association of the Paper Industry.

Wisconsin Farmers Using Lime Sludge

Farmers in the Wisconsin River valley are making good use of the lime sludge from the different sulphate mills.

At the plant of the Nekoosa Mill of the Nekoosa-Edwards Paper Co., all of the lime sludge is being shipped out as fast as it can be made. There is no charge for this excepting a charge to cover the cost of loading same, and farmers are making requests for 4 or 5 carloads of this material per day. Many of the farmers within hauling distance are hauling this away by the wagonload or truckload.

Lime sludge as a fertilizer is one of the best known, and those who have used it once are very enthusiastic over it, as it increases the productivity of the soil to a considerable extent.

At the plant of the Wausau Sulphate Fibre Co. at Mosinee, their entire output is being taken by the farmers, no charge being made for it except the loading charge when it is shipped, and the farmers are privileged to come and take as much as they desire by hauling themselves.

The available supply at the Stevens Point Pulp and Paper Company is all being taken.

There may be many sulphate mills in the United States who are now throwing this valuable material away, or dumping it in the river, and if they will make known to the farmers or agricultural agent that this is available, there is no doubt but what they will be able to get rid of all they are making, and also aid the farmer to a considerable extent.

Most of the mills that are disposing of this material have orders to exceed the supply.

Forest Problem Being Given Attention

The formation of a committee to consider the development of the Wisconsin forestry policy in the future is being considered by state officials, and such an organization will come into being early in the coming legislature, if not before.

The adoption of the constitutional amendment giving the legislature power to appropriate money for forest conservation and rehabilitation is not expected to result in the adoption of an elaborate program of forestry during the coming session of the legislature.

The state has been carrying on some activities in the line of forest conservation without specific authority for that purpose. Forest fire fighting has been carried on under the provisions of police protection. Young trees have been grown on state land primarily to be sold to farmers, and legislative provisions made as a farm project.

The passage of the amendment means that the word forestry may now appear in the statutes and action can be taken directly on the problem of building up Wisconsin tree lands.

The state now has about 300,000 acres of land to which a forestry program might be applied. Paper mills and lumber companies frequently allow land to revert to the counties for taxes after the wood has been removed. Much of the land holding conifer forests is not suitable for farming and the denuded lands that have reverted to the counties are a burden to the political units.

Conservationists feel certain that the state will take over no new lands for the purpose of development. They also express the belief that Wisconsin will not start a gigantic scheme of planting trees on the vast areas of cut-over lands. At least not for the present.

In connection with the considerations of the future forestry policy of Wisconsin, members of the legislature will make a study of forestry policies in force in other states. Louisiana has a system where lumber companies pay into the state treasury two per cent of the value of their cuttings and this sum is used for replacement of trees that are cut away. Minnesota and Michigan also have systems for replacing the disappearing trees.

The big vote rolled up for the forestry amendment is said by conservationists to be due largely to the fact that people have become familiar with the woods problem by actual observation due to the facilities for travel presented by the automobile.

It looks as though at last something has been started in Wisconsin for the good of the pulp and paper mills and that a large reforestation program will be started which will bring back to Wisconsin large forests with which the state was once blessed.

Print Paper from Black Gum

The print paper industry promises to be revolutionized through experiments now being carried on by the United States Forest Products Laboratory at Madison, Wisconsin, according to officials of that institution. The laboratory has worked out processes by which it is claimed print paper of good quality can be manufactured from black gum wood.

It is declared that under the new process, nine-tenths of a cord of gum wood produces one ton of paper, compared to 1.2 cords of spruce required to produce a ton of newsprint by the usual process. Similar results have been obtained with poplar and birch, it is said.

This new product and the process by which it is made are still in the experimental stage, declares a statement of the laboratory officials. Nevertheless the high yield and excellent color of the pulp give promise that such broad leaf woods as aspen, birch, beech, maple, black and tupelo gum and cottonwood may be used profitably in the manufacture of newsprint to supplement the rapidly diminishing supply of spruce, which is at present practically the only species considered suitable for newsprint.

These broad leaf woods are widely distributed, constitute a large proportion of the present stand of growing timber, show rapid growth and usually reproduce easily. Many of them have only limited uses as lumber, hence their utilization for pulp wood is an important advance toward conserving the timber supply.

Move to Establish Boat Line

The establishment of a boat line to be operated between Green Bay, Wis., and lower Lake Erie Ports, including Detroit, Toledo, Cleveland and Buffalo, appears as though the proposition would likely go through.

This is of particular interest to the paper and pulp mills of Wisconsin, and especially those of the Fox River Valley, as this line contemplates the handling and distribution of foreign and Canadian shipping, including wood pulp and other paper mill supplies.

Most of the large paper mill interests have been interviewed on the matter and are enthusiastic about the proposal it is said. It is also believed that the warehousing and transfering project can be supplemented from Green Bay to the various paper mills in the Fox River Valley. For example, it is said, that wood pulp brought to Green Bay by boat could be stored and then moved up the river by barge much as the coal is now handled to the mills up river.

The scope of the plan and the possibilities of it are suggested in the experience of the shippers who within the last 30 days arrived in this country with 6,500 tons of Swedish wood pulp direct from Sweden, carried in three small boats, that had made the voyages across the Atlantic and down the St. Lawrence and the lakes to Lake Michigan.

Upon arrival of the boats, an effort was made to find storage and warehouse facilities for the traffic at Green Bay or other nearby ports within economical reach of the various Wisconsin Paper Mills. No facilities were available in that

vicinity and the material was taken to Milwaukee, Wisconsin. There the owners of the boats are at a distinct advantage in distributing the pulp because of the distance from the Fox and Wisconsin Valleys which are the principal paper manufacturing centers of the state.

This would also serve to transport shipments of paper from these mills to the different points above mentioned, as well as foreign shipping that now must go by rail to other seaports for transportation.

Michigan News

December 1, 1924.

Dunn Sulphite Paper Co. Plant Complete

The O. F. Miller Company, builders, Kalamozoo, have completed the erection of the new mill at Port Huron for the Dunn Sulphite Paper Company. Built according to plans and specifications prepared by the engineering firm of Billingham and Cobb, it is said to be one of the most interesting, efficient and economical mills in the state. It has been possible to house the entire industry in a two-story structure 210 by 76 feet in dimensions, an unusually limited space. The building is strictly fireproof, the materials used being reinforced concrete, steel and steel sash, and vitrified brick. The mill is equipped with one 132-inch Yankee Fourdrinier machine, product of the Beloit Iron Works.

O. F. Miller Co. Gets Constantine Job

The O. F. Miller Company of Kalamazoo has been awarded the contract for the erection of a storage warehouse for the board mill of the American Can Company, located at Constantine, Mich. The new structure will be one story high and about 300 feet in length. It will be of standard mill construction and will cost about $25,000.

The American Can Company, which for years took the product of the Constantine Board and Paper Company on a contract basis, has leased that plant for a period understood to be about 10 years. The mill is in fine condition throughout and economical to run.

Production Rating of Kalamazoo Mills Increased

The production capacity of Kalamazoo paper mills has increased 112 tons for every 24 hours of operation during the past two years.

Within the two-year period, 1923 to 1925, the capacity of Kalamazoo mills advanced from 1,428,000 pounds to 1,652,000 in 24 hours. The major portion of this increase is accounted for in the completion of the new mill for the Kalamazoo Vegetable Parchment Co., giving that concern a total daily tonnage of 260,000 pounds as against 100,000 pounds in 1923.

The reconstructed mill of the Western Board and Paper Company can now turn out 160,000 pounds daily as compared with 100,000 pounds two years ago. The Rex mill has increased from 24,000 to 38,000 pounds. Other local concerns carry the same capacity rating as 1923. The figures of each concern are: Allied Paper Mills, 450,000; Bryant Paper Company, 500,000; Hawthorne Paper Company, 24,000; Kalamazoo Paper Company, 150,000; Standard Paper Company, 180,000; Sutherland Paper Company, 90,000.

The above reports are easily 25 to 33 per cent below the actual capacity of several concerns. Reports from the Standard Paper Company for periods of several days running have shown over 200,000 pounds daily, frequently as high as 220,000 in 24 hours. On favorable runs, the Allied Paper Mills, Bryant Paper Company and Kalamazoo Paper Company have produced 30 per cent over the tonnage alloted them.

K. V. P. Honors Old Employees

Fourteen years and eight months continuous service with the Kalamazoo Vegetable Paper Company and just 11 days of vacation during that period, is the record of Charles Conrad, pioneer on the company's payroll.

Mr. Conrad is in charge of the acid house and the acid tanks and is concerned at first hand in the mixture of the acids that go into the preparation of parchment papers. It is not only particular work, but more or less hazardous. The mixing process must be done by an expert for fear of entailing both loss in product and life. There are times when putting certain ingredients in the tanks that the fumes could easily overcome a novice and prove fatal.

The Kalamazoo Vegetable Parchment Company now boasts 24 employees who have passed the 10-year-old mark in time of service. Twenty have received diplomas for service. Four others will be awarded in the near future.

"Bob" Walker, employment manager, gives the list as follows: Charles Conrad, Marion Weston, Alice Rupert Butler, Henry Butler, Earl Boldman, C. McMillen, George Martin, Alonzo Zeppernick, Peter DeWolfe, Adrian Tiersen, Ben Grover, S. Ward Kennedy, C. S. Campbell, Maude Thompson Choffat, Alfred Conrad, Harry Boldman, Karl Martin, Alfred Southon, John Carter, J. C. Knight, Ed Kelly, Steven Martin, John Schlick and Don H. Ross.

Bradford Paper Co. Incorporated

The Bradford Paper Co., authorized capital $500,000, has filed articles of incorporation with the Secretary of State and the County Clerk. Clarence A. Bradford, formerly vice president and sales manager of the Rex Paper Co., is president and general manager of the new company. George K. Taylor, president of the Taylor Produce Co., is vice president. H. Clare Jackson, attorney, is secretary-treasurer. These three and H. A. Youngs, J. L. Hollander and J. Grant Fox comprise the board of directors.

Mr. Bradford reports that the machinery has been ordered, and the work of getting the Kalamazoo plant ready for equipment is progressing rapidly.

The Bradford Paper Company plans on specializing in high grade coated book, operating only a coating plant at present. They have ordered four, extra heavy, Waldon coating machines, and have let the contract for their drying system. They plan on getting started within the next few months.

Bryant Begins Work on New Machine Shop

Erection of a new machine shop and salvage plant by the Bryant Paper Company has started. R. D. Boyer has the contract. The plans and specifications call for a building 172 by 57 feet and 40 feet high. Brick, reinforced concrete and steel will be used in the construction. This unit has been located as near the center of the industry as possible, thus facilitating handling machine and tool work. In the equipment and machine layout, provision has been made for the heaviest work required around a paper mill. A traveling crane will be constructed in the building, thus making it possible to handle rolls and other heavy things, up to ten tons.

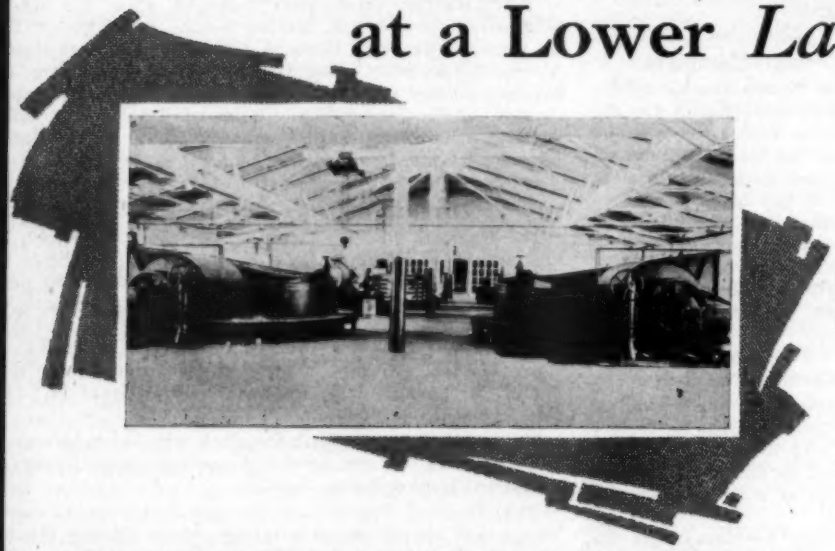
Mill Union Chief Makes Survey

An inspection of conditions in the Kalamazoo Valley district is being made by Arthur Huggins, Holyoke, Mass., sixth vice-president of the International Papermakers' union. Mr. Huggins has been in the city for several days and plans to have his final report ready to submit to the executive committee of the organization, which meets early in January at the headquarters office, Albany, New York.

"Our agreement with the paper mills expires May 1," said Mr. Huggins, "It will be my aim to have completed the survey here, so that the executive board can act regarding conditions in Kalamazoo. There was a time when the local union was very strong and active, but the membership has slumped off badly and interest seems to be lacking. Whether or not it will pay us to build up the organization here again remains to be seen. What I might have to say I will say to the executive committee, leaving the matter to it to act on my recommendations."

The Bradford Paper Company, Kalamazoo, Mich., authorized capital $500,000, has filed articles of incorporation with

Why Niagara Beaters Give *Increased* Production at a Lower *Labor Cost*



Dual installation of Niagara Beaters in a high grade writing mill.

1. SHORTENED BEATING TIME—One beater does the work of two and sometimes three beaters.
2. LESSENED POWER COSTS—The power is more effectively transmitted to the stock with a saving of 15 to 30 per cent.
3. SAVING IN FLOOR SPACE—A congested beater room can be relieved or additional equipment installed without enlarging the beater room.
4. SMALLER INITIAL INVESTMENT—The housing of the smaller installation lowers the construction costs, and fewer machines will do the same work. The saving in investment for both beaters, and power equipment necessary to drive them is very large.
5. LOWER LABOR COSTS—Because of the fewer machines, fewer men are needed.
6. UNIFORM QUALITY OF BEATING—The stock is thoroughly mixed, thereby eliminating all dead spots.

¶ An attractively illustrated booklet giving full particulars regarding the Niagara Beater is just off the press. Your copy is waiting for you. It is yours on request. Write for it today and post yourself on the most successful modern beater.

VALLEY IRON WORKS CO.

APPLETON, WISCONSIN

New York Office: 350 Madison Ave.

the secretary of state and county clerk. Clarence A. Bradford, formerly vice-president and general sales manager of the Rex Paper Co., is president of the new company. George K. Taylor, president of the Taylor Produce Co., is vice-president; H. Clare Jackson, attorney, is secretary-treasurer. These three and H. A. Young, J. L. Hollander and J. Grant Fox comprises the board of directors.

Pacific Coast News

December 1, 1924.

New B. C. Pulp Mill Being Planned

From Victoria, B. C., comes word that an American syndicate is planning the construction of a pulp mill at Port Alberni, and hydro-electric development of the Stamp River Falls by the building of a dam across the canyon to provide electrical energy for the plant.

The proposed project is now receiving attention of the land's department of the Esquimalt and Nanaimo branch of the Canadian Pacific railway.

Application of the syndicate embraces the building of a pulp mill on the flats at Port Alberni, electrical development of Stamp river falls, and erection of a second dam at the outlet of Great Central lake.

Plant extension work at the Powell River Mills, in British Columbia is well under way. Construction work on the new wharf and on the raising of the existing dam and headgate works is rapidly nearing completion, the wharf structure proper being now practically finished, and the 3,000-ton capacity paper storage warehouse about sixty per cent complete. The new wharf tracks are being laid.

At the dam both sets of headgates have been erected, and the bulk of the concrete is now poured. The Taintor gate and log chute gate hoist and motors have been delivered at the site, as have also the rails, etc., for the track which is to be laid across the top of the Taintor gate hoist. The work on this track is now well under way. One hundred and fourteen steel piles have been driven to date, forming part of the 400-foot core wall, which will run diagonally underneath the planing mill yard. These represent some eighty-three tons of steel.

The new surge tanks and vent pipes for the existing three penstocks have arrived, and the new ones are being erected in place of the old ones, now being dismantled.

The Columbia River Paper Mills are commencing work on a 100x200 foot building to be used for a finishing room and warehouse. It is of steel and face brick construction at a cost of $35,000. Less glass and more brick is being used in building the warehouse than was used in the main building. The contract calls for completion by January 15.

Among the recent heavy orders taken by the Oregon Paper Mills was that of the Pacific Manifolding Book Company, who is furnishing eight carloads of printed sales books to the Meier & Frank Co., a large department store of Portland. This paper order was the largest of its kind ever placed by any firm west of Chicago. The Oregon Paper Mills are shipping daily heavy orders to supply the California market.

Stockholders of Defunct Co. to Hold Meeting

Stockholders of the defunct Alpine Paper Manufacturing Co., of Coquille, Oregon, are to hold a meeting in the near future at the Coquille City Hall, in order that a concerted action might be inaugurated. While the meeting is an open one, those who have paid in on their stock are the ones who will be specially requested to attend.

The Coquille Chamber of Commerce reported that $700 had been repaid to the stockholders and that no more restitution was being made by the incorporators, who were Wm. T. Alpine, F. E. Thompson and Miss Pritchard. Statements have been given out by the Alpine Co. that the stockholders would be reimbursed but so far none has been received.

Continued rise of the Willamette river has made possible the opening up of all departments of the two paper mills, the Hawley and the Crown Willamette plants. Grinding has been shut down during the long period of low water and full forces are now at work in both plants with the grinders again in operation.

Several miles of railroad grade are being constructed near the Willamette Paper and Pulp Company's plant in Wahkiakum county, Washington. This will throw the present steep incline out of use for the new one.

The Blake McFall and The Endicott Paper Co. have recently traded their interests in Portland and Seattle, the Blake McFall Co. receiving the Seattle branch, and the Endicott, the one in Portland. The two stores in each city will be consolidated and operated under its revised management.

Columbia Mills Issue Gold Notes

The Lumbermens Trust Company of Seattle, is offering $400,000 of secured five and one-half per cent gold notes of the Columbia River Paper Mills, Vancouver, Wash. The issue is dated November 1, 1924. The bonds are due serially on November 1 and May 1, from 1925 to 1927, and are priced according to maturity to yield from five and one-half to six and one-half per cent.

This closed issue of secured gold notes constitutes a first charge on the land, buildings and other fixed assets of the company, having a conservative value in excess of $1,500,000 and it represents the company's entire funded debt. The trust indenture provides among other things that, during the life of these notes, the company shall not create or consume any long term indebtedness or any form of indebtedness ranking senior or equal to the notes.

The company has increased its capital stock from $750,000 to $1,250,000.

The Coast Paper Company, Ltd., has been incorporated at Vancouver, B. C., for $35,000, as paper manufacturers and dealers.

U. S. Steel Corp. Purchases Cyclone Fence Co.

The consummation of negotiations which have been under way for some time have now been concluded, whereby the properties of the Cyclone Fence Company have been purchased by the United States Steel Corporation.

The transfer of the Cyclone properties includes their factories at Waukegan, Ill., and Cleveland, Ohio, also plants at Fort Worth, Tex., and Newark, N. J.

Through the acquiring of the Cyclone Fence Company by the United States Steel Corporation, the corporation is entering into a phase of the fence manufacture not heretofore practiced by them, and in which the Cyclone Fence Company has led the field in its line of manufacture.

It is understood that no change in policy is contemplated, the business to continue under the name of the Cyclone Fence Company, carrying on, with the exception of its principal officers, under its present organization as a subsidiary of the corporation.

Service Chart on Belt Fasteners

As a part of an advertising campaign the Crescent Belt Fastener Company is sending out to the different paper and pulp mills a large eight-page folder on proper belt joining in the paper mill. Starting with the difficult cone drive, the problems met with in the paper mills are all explained and remedies suggested.

It is illustrated with photographs of actual conditions in some of the largest paper mills in the country. For the benefit of paper mills who are already using Crescent Belt Fasteners, a large reference chart is included and at a glance the proper Crescent Plate and Crescent Rivets to use under any condition in the paper mill can be found.

Copies of this helpful folder can be obtained by writing to the Crescent Belt Fastener Company, 247 Park avenue, New York City.

Caldwell Screw Conveyor for Every Service

CALDWELL HELICOID or continuous flight screw conveyor, is rolled from a single strip of metal. Therefore it is very strong even before the pipe is inserted, and resists to the full strength of the metal the lateral pressure due to pushing forward the material. The absence of laps and rivets resists wear and prolongs the life of the conveyor.

Cast Iron Conveyors

Cast iron conveyors are particularly suitable for use with acid materials, which would rapidly corrode and destroy the ordinary steel conveyor. Pipe and flight are cast in one piece.

Ribbon Conveyor

For handling sticky materials such as molasses, sugar, hot tar, asphalt, etc., this type of conveyor is best suited. Thus the material is prevented from collecting on the flight as would be the case in an ordinary conveyor. Its capacity is as much as the solid flight conveyor.

Winfrey Patent Cleaner Conveyor

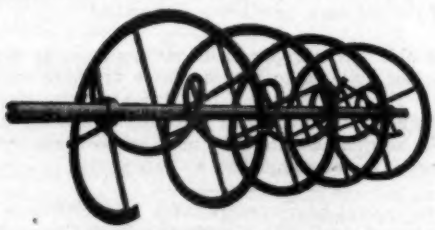
Where especially thorough cleaning is desired, this form of conveyor is recommended. The action of the conveyor is to lift up the material in transit, and separate it, allowing the dirt to fall out. The progress of the material is rapid.

Paddle Flight Conveyors

Caldwell makes a complete line of paddle mixers for every character of work to be done. The paddle flight conveyor shown here is a sectional one. It is non-corrosive, being made of cast iron.

Cut-Flight Conveyor

This type of conveyor, used generally in cotton seed oil mills, removes sand, dirt, and grit from the cotton seed or other materials being conveyed. This conveyor is placed in a perforated steel box through which the foreign matter sifts out.



Double Ribbon Conveyor

For mixing starch, dough and similar materials the double ribbon conveyor is recommended. The hand, or "flow direction" of the outer ribbon is opposite from that of the inner one. Thus, as the material is worked back and forth it is thoroughly mixed.

H. W. CALDWELL & SON CO. C-37

LINK-BELT COMPANY, OWNER

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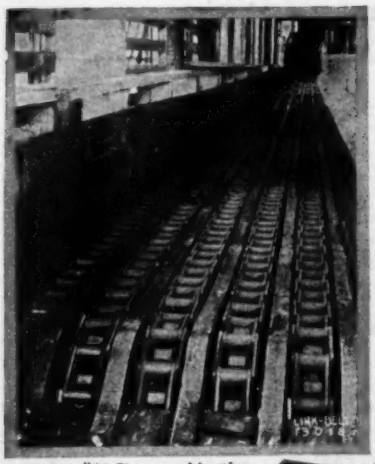
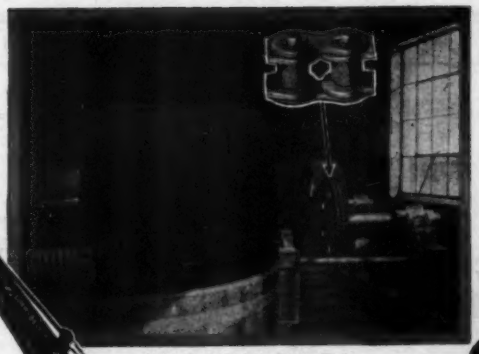
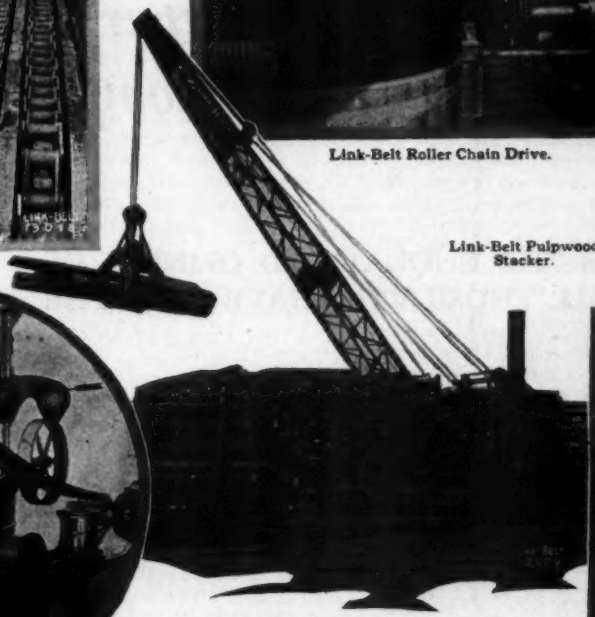


Link-Belt "C" Class combination iron and steel chain conveyor.



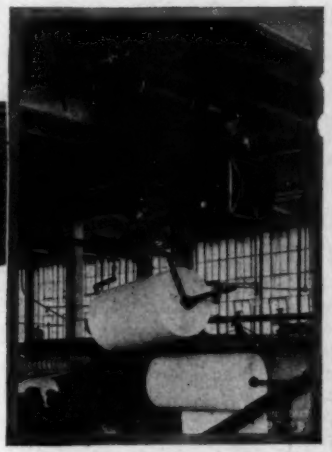
Link-Belt Roller Chain Drive.

Link-Belt Pulpwood Stacker.



Link-Belt Locomotive Crane handling pulpwood.

Link-Belt Silent Chain Drive.



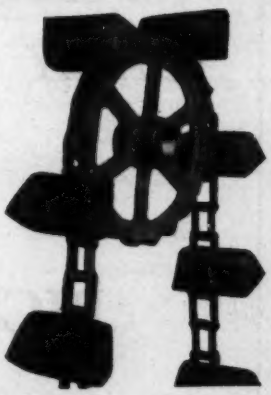
Link-Belt Electric Hoist.

LINK-BELT
Serves the Industry

Saving your time, labor and power—that's the goal toward which we have worked for half a century. How well we have succeeded is evidenced by the fact that seven plants are now required in the production of Link-Belt material handling equipment and chains for every service in elevating, conveying and power transmitting work.

The illustrations show but a few applications of Link-Belt material handling equipment in paper mills.

In the transmission of power direct from motor or engine, Link-Belt Silent Chain stands supreme. It is flexible as a belt—positive as a gear—more efficient than either. Send for 144-page price-list data Book No. 125. It is a handbook of silent chain practice and design. Books on Link-Belt Products sent on request.



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H660

LINK-BELT

"The Last Word in Paper Making Machine Design and Accomplishment"

IS THE UNQUALIFIED OPINION OF
ALL THOSE WHO HAVE SEEN THE

204" FOURDRINIER MACHINE

IN THE MILL OF THE

DAILY NEWS PAPER CORPORATION

As Built by

RICE, BARTON *and* FALES,
Incorporated

Worcester
Massachusetts

Daily News Paper Corporation New Mill

MAKING paper for the new Liberty Magazine, the new mill of the Daily News Paper Corporation, at North Tonawanda, New York, started operating October 13th. The mill was completed and ready for operation a year after construction was started under the direction of Mr. Warren Curtis, president and general manager of the company. All construction and engineering work was carried on by the staff of the company co-operating with the Ontario Paper Company, of which Mr. Curtis is also the president and general manager, making newsprint for the Chicago Tribune.

The fact that paper was turned out the first day of operating and production continued without any serious delay speaks well for both the equipment and operators. The mill is in charge of Mr. J. E. Hedin, the general superintendent, who came to this company from the American Writing Paper Co., and has had many years of experience in making paper and pulp of all grades.

The new mill is located on North Tonawanda Island by the Erie Canal, making shipment by boat possible either to New York or Chicago. The buildings are of reinforced concrete with steel window sash and gypsum roofs.

Beater Room

In the beater room are installed four 2,000 pound beaters, furnished by E. D. Jones and Sons, of Pittsfield, Mass. These are driven by two 200 H. P. General Electric synchronous motors—0.9 power factor—each with two opposite drive pulleys furnished with the Lenix drive and leather belts. Two concrete chests, equipped with horizontal agitators, receive the stock from the beaters. From these chests, the stock is raised by Morris centrifugal pumps and refined through an E. D. Jones Majestic Jordan, driven by a 150 H. P. synchronous motor, into the machine chest. From the machine chest, the stock is pumped through a second Jordan directly into the machine head box. The second Jordan is located in the machine room, so that at any time when the machine tender finds the stock too slow or free to suit him, he can make corresponding adjustments on the Jordan that will take effect immediately on the machine.

Clay, alum, color and size are handled in the usual manner, the DeCew size system being used.

Machine Room

A Rice, Barton & Fales 204-inch machine is installed in the machine room, which is built large enough to accommodate another similar machine for future expansion. The maximum speed of the machine is 800 feet per minute, but it is ordinarily operated at 500 to 600 feet per minute on book paper. This gives a corresponding production of from 60 to 70 tons daily.

Considerable saving is made in the life of the felts and wires and power consumption by the use of ball bearings on the breast roll, table rolls, wire return and felt rolls, S K F bearings being provided. Rubber covering is provided for the wire return rolls. A Millspaugh suction roll is in use for the couch. No trays are used except a small one near the breast roll.

White water is used in the beaters, regulating boxes and the showers, so that very little waste goes to the sewer. Suction for the wire and felt boxes is furnished by Nash pumps, and a Connersville pump serves the suction couch.

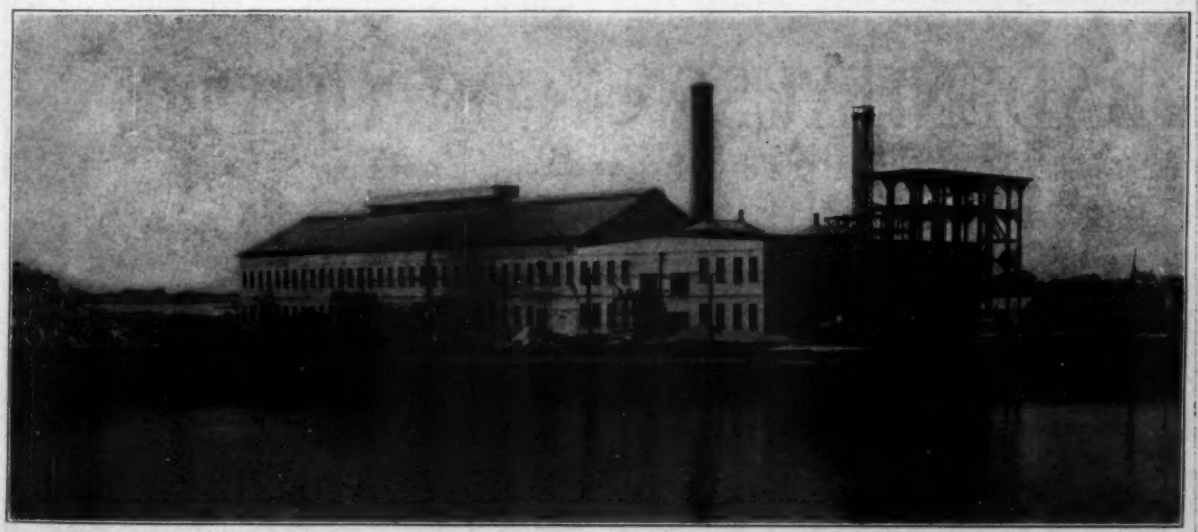
Trap doors in the floor opening into chutes, one located by each of the three presses, receive wet broke from the presses, dumping it into boxes in the basement, where it is taken to a 1,500 pound E. D. Jones broke beater near by. Dry broke is also sent to the basement and put through this beater.

The paper machine is equipped with forty five-foot dryers, four of which are used for felt dryers, and two for sweat rolls at the end of the machine which add a small amount of water to the paper before calendering. The Stickle system with Armstrong steam traps is used for removing the condensation in the dryers. The dryer bearings are of babbitt with graphite plugs to aid in lubricating. The bearings are self aligning. A Sheehan rope carrier takes the sheet over the dryers.

The machine is driven by a General Electric sectional drive, with all motors connected direct to the different sections of the machine. All of the dryers are in one section driven by one motor. The motors are driven by a 500 K. W. turbogenerator set, located in the basement. Exhaust steam from the turbine is used for drying.

The two calender stacks were made by the Farrell Foundry and Machine Co. One stack is equipped with Warren doctors and the other with Frossard. As a safety measure, ladders are provided in place of the usual steps enabling the men to get a better footing while working on the calenders. From the calenders the paper goes to a Rice, Barton & Fales winder and Pope reel. The rolls are taken from the machine by a General Electric 3-ton hoist to the loading platform. Plans for future extension include a finishing room at this end of the mill. The paper will then be taken directly from the winder and loaded in cars from the platform inside the building.

To prevent any drip from the ceiling, and making a hood over the machine unnecessary, warm air is furnished into the space between the roof and the gypsum ceiling suspended



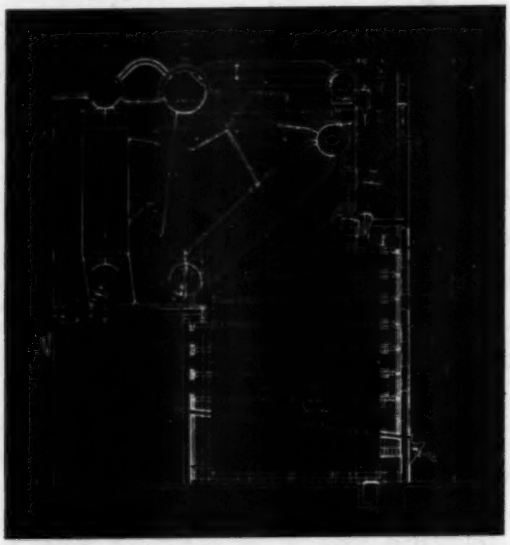
New Mill of The Daily News Paper Corporation, North Tonawanda, N. Y. Sixty-ton Soda Pulp Mill, now under construction, shown at the right

DAILY NEWS PAPER CORPORATION

North Tonawanda, New York, Operate

BADENHAUSEN

High-Efficiency Preheater Boilers



The above drawing shows two BADENHAUSEN High-Efficiency Preheater type boilers, 1018 H. P. each, equipped for burning powdered fuel, installed in the plant of the Daily News Paper Corporation at North Tonawanda, N. Y.

Badenhausen Boilers

Superheaters and preheaters are manufactured in our large modern plant equipped with the most up-to-date machinery designed by Mr. Badenhausen for economical and perfect boiler fabrication. Our Shop Superintendent, Engineers and Mechanics have been with us for many years.

Facts and Figures

DATA compiled by outside engineers in conjunction with the resident engineers of some of the largest industries where Badenhausen boilers and other types of boilers are installed, show the remarkable operating efficiency and tremendous saving of the Badenhausen boiler over other makes. Copies of these reports will be sent upon request.

BADENHAUSEN CORPORATION

Boilers, Superheaters, Preheaters

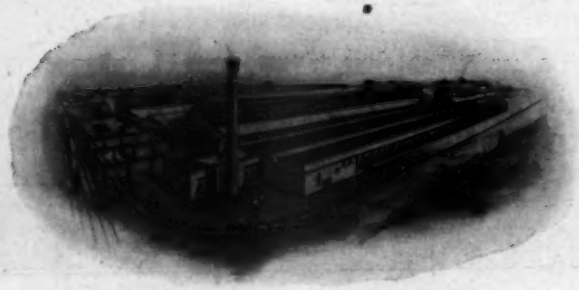
General Offices: Suite 900 Victory Building, PHILADELPHIA, U. S. A.

SALES OFFICES

PHILADELPHIA
1011 CHESTNUT STREET

NEW YORK
120 BROADWAY

DAYTON
REIBOLD BUILDING



CORNWELLS, PHILADELPHIA PLANT

SALES OFFICES

ST. PAUL
1019 GUARDIAN LIFE BLDG.

DENVER
211 TRAMWAY BLDG.

PITTSBURGH
HOUSE BUILDING

from the roof trusses. This warm air heats the ceiling and passes down through four openings in the corners of the room along the underside of the ceiling to the ventilator in the middle of the room, eliminating any possibility of drip or any dead air spaces above the machine. The air is supplied by a Sturtevant unit heater. Warm air is also supplied to the basement by another Sturtevant heater. This air passes up around the dryers and up through the floor through an iron grating running along the front side of the dryers, assuring ventilation around the dryer section.

Soda Pulp Mill Under Construction

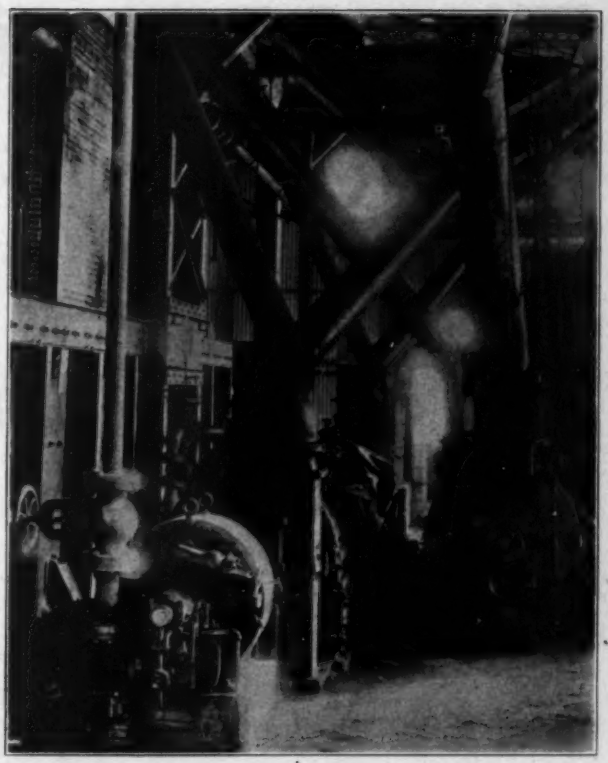
A 60-ton soda pulp mill is now being built at the north end of the paper mill. A modified soda process is to be employed which is expected to produce a more opaque and easier bleaching pulp. With a continuous cauticizing and lime recovery system, being installed by the Glamorgan Pipe & Foundry Co., under direction of W. D. Mount, consulting engineer, this will be one of the most up-to-date soda pulp mills in existence. The lime kiln used in this system was made by the Vulcan Iron Works. It is expected that the pulp mill will be operating by the first of the year.

Lopulco Pulverized Fuel System

Two Badenhausen, high-efficiency, preheater type boilers, 1018 H.P. each, supply steam to the pulp mill and turbo-generator unit used in connection with the sectional drive. These are each equipped with two Lopulco pulverizer units of the direct type, furnished by the Combustion Engineering Corporation. The pulverizers, driven by 60-H.P. Kerr turbines, are of sufficient capacity to operate the boilers at 250 per cent of normal rating.

Coal is either taken from the pile by a Brownhoist crane, or dumped directly from the cars into the crusher located outside of the building at the end of the track. From the crusher, it is carried by a belt conveyor to a bucket elevator and taken to the top of the building. From here it passes onto a belt conveyor over a magnetic separator and is distributed in the re-enforced concrete bunker. From the bunker, the coal is fed into the pulverizers and blown directly into the burners.

The furnaces are of the Lopulco hollow wall type. The passing of air through the hollow walls serves two purposes—cooling the walls and preheating the air for combustion. A part of this preheated air is used in the pulverizers in blowing the powdered coal into the furnace. Water screens, consisting of a series of tubes passing through the furnace, prevent the formation of slag in the bottom of the furnace. The system is capable of handling any grade of bituminous coal with a furnace efficiency of 83 per cent.

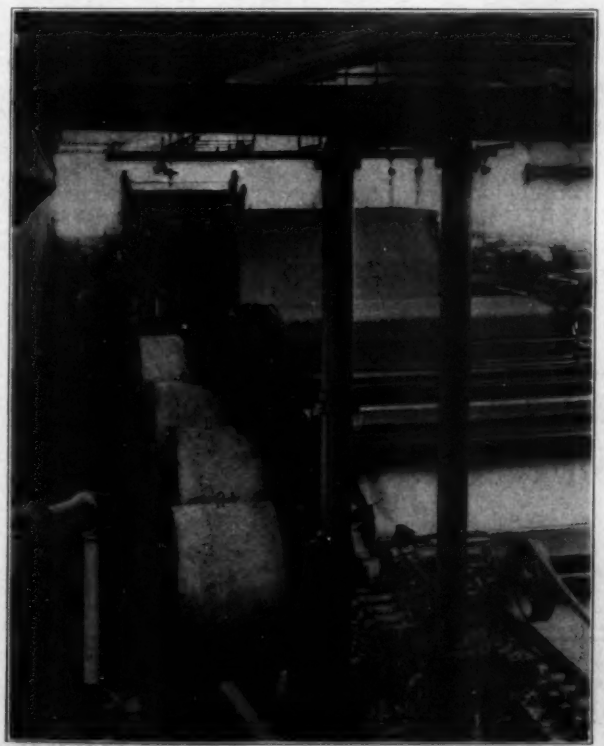


Lopulco Pulverized Fuel System—Four units furnishing two 1018 H. P. Badenhausen boilers. Daily News Paper Corp. Mill

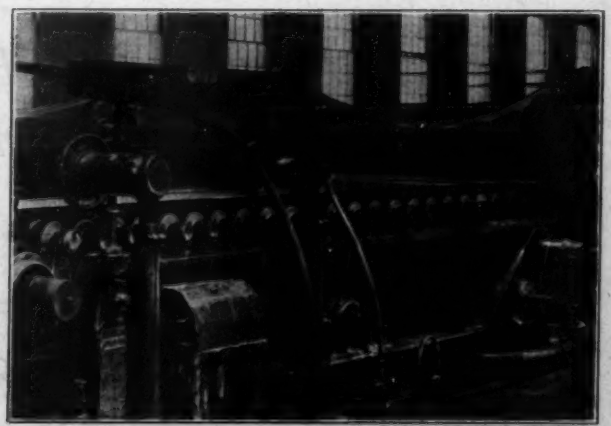
A simple but effective arrangement for burning oil, consisting of a storage tank, pump and nozzles, was installed by the operators for starting, use in cases of emergency, and holding steam when the mill is down.

Two Alberger three-stage centrifugal pumps, driven by Curtis turbines, supply water to the Cochrane feed water heater. The stack, 10 feet in diameter at the top and 125 feet high, is built of brick. This was erected by the M. W. Kellogg Co., of New York City.

The water supply for the mill and boiler plant is taken from the Niagara River and filtered through a Norwood sand filter.



View of drive side of Rice, Barton & Fales 204-inch Machine, General Electric Sectional Drive. Daily News Paper Corp. Mill



Wet end of Rice, Barton & Fales 204-inch Machine. All rolls equipped with ball bearings. Daily News Paper Corp. Mill

The New "BAGLEY" FOURDRINIER MACHINE

AT THE

COLUMBIA RIVER PAPER MILLS

VANCOUVER, WASHINGTON

Embodies 101 Years of Experience
Which Means

THE BEST MACHINE
THAT CAN BE BUILT

Unsurpassed in Material and
Workmanship

Quality and Efficiency Our
First Consideration

THE BAGLEY AND SEWALL COMPANY
WATERTOWN - - - - NEW YORK

Columbia River Mills' Efficient Plant

THE NEW plant of the Columbia River Paper Mills in Vancouver, Washington, is unique among paper mills in the Pacific Northwest and is one of the most modern paper mills in the United States, and the first mill to manufacture parchment paper on the Pacific Coast.

The commencement of actual operations recently witnessed the realization of a twenty-year dream of Mr. Leadbetter, the president of the concern. For nearly a score of years the veteran paper manufacturer has visioned the ideal paper mill, centrally located as to raw material, labor supply, and shipping facilities, and electrified for economical production.

The mill is unique among paper mills because the materials flow through it, from raw stock to the finished product, in one continuous straight line, without crossing each other at various points. The straight line method of manufacturing has proven to be the most economical.

Building Erected in Record Time

A record for speedy as well as for modern factory construction was made by the Austin Company in erecting the immense building that houses the paper manufacturing units of the Columbia River Paper Mills.

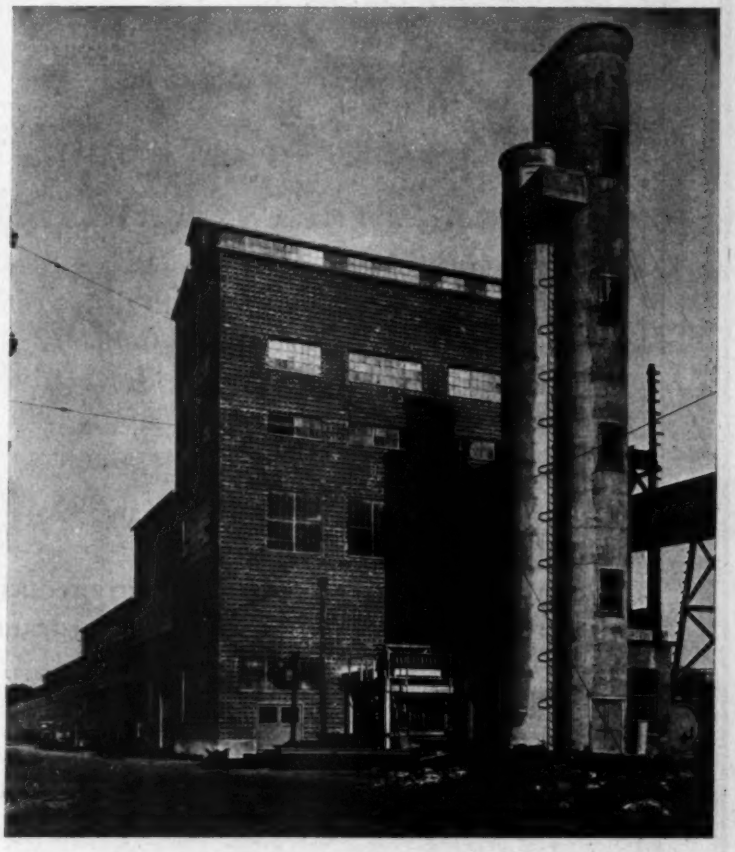
Commencing on November 22, 1923, the date that the first steel for the building was hoisted into place, the Cleveland contractors succeeded in completing their contract for the two units of the paper mill building in 74 working days. The entire building is 492 feet in length and 82 feet in width, containing the paper mill and the digester house. The paper manufacturing unit of the building is considered to be probably the best naturally illuminated paper mill in the Northwest. It is of complete steel frame, with Fenestra steel window sash. The glass used in the building is a special factory ribbed glass, built up of prisms which break up the rays of the sun and give a non-glaring distribution of light, without at the same time distributing the heat that ordinarily accompanies the sun's rays. The paint used on the building is made from a formula specially prepared by the Detroit Graphite Company for protection against rust and corrosion from moisture and acid fumes.

The digester house section of the building is 100 feet high, which is a record in the Northwest for interlocked tile construction. The wall is so constructed that the weight of the tile is carried on a steel frame at intervals of every eight feet, so that the weight of the tile is taken direct into the foundation of the building by a steel frame.

View from the northwest corner of the building housing the paper making unit of the Columbia River Paper Mills. The structure is built of tile, glass and fabricated steel construction

From Sawmill to Finished Paper

The manufacture of the paper pulp for paper making begins in the sawmill where the bark is first stripped from the logs. Only the slabs of the logs which cannot be used for lumber



Exterior view of digester house of Columbia River Paper Mills and the Acid Towers

are chipped and used for pulp. Most every piece of machinery in the sawmill and the chippers are electrified with Westinghouse individual motor drive which eliminates all belting and basements. The sawmill has a guaranteed capacity of 125,000 feet of lumber daily and has already cut as high as 147,000 feet of lumber in a single eight-hour shift.

Six slab barkers have been furnished by D. J. Murray Manufacturing Co., also an 84-inch chipper and a six-section chip screen; other chippers by the Carthage Machine Co. and Mitts & Merrill. The grinders were supplied by the Dayton Globe Iron Works Co.

The sawmill unit also supplies fuel material. This fuel, which consists of sawdust and waste, is conveyed from the sawmill to the power house by means of a blow-pipe system.

Foundations have been laid for four digesters, although only two have so far been installed. These digesters, furnished by the Willamette Iron and Steel Co., are 49 feet in height and have an inside diameter of 15 feet. The inside of the digesters are lined with acid-resisting brick, seven and one-half inches thick. The acid system was installed by G. D. Jenssen Co. All tanks were supplied by the National Tank and Pipe Co. There are three acid storage tanks, each having a capacity of 50,000 gallons.

A worm knotter and the ground worm screen were furnished by the Baker Manufacturing Corporation; also a Feeney stock regulator. Thirteen 12-plate flat screens, two 36 inch x

THE COLUMBIA RIVER PAPER MILLS
Vancouver, Washington

Have installed our equipment as follows:

THE CENTRIFUGAL SCREEN

which is so well KNOWN AS the SUPERIOR pulp screen. This screen is now built with direct connected Vertical Shaft Motor drive (which is type Columbia River Paper Mill has) also with Horizontal Shaft Motor drive as well as Universal belt drive.

THE WORM KNOTTER

so well known through its many years of use in large numbers, for its value in removing knots and other coarse material from the pulp thereby greatly reducing the work put upon the screens as well as making for cleaner pulp.

THE FEENEY AUTOMATIC STOCK REGULATOR

which has no equal in any machine made for keeping desired weight on the sheet of paper being made. Nearly SEVEN HUNDRED in daily use on all kinds of paper are attesting this fact.

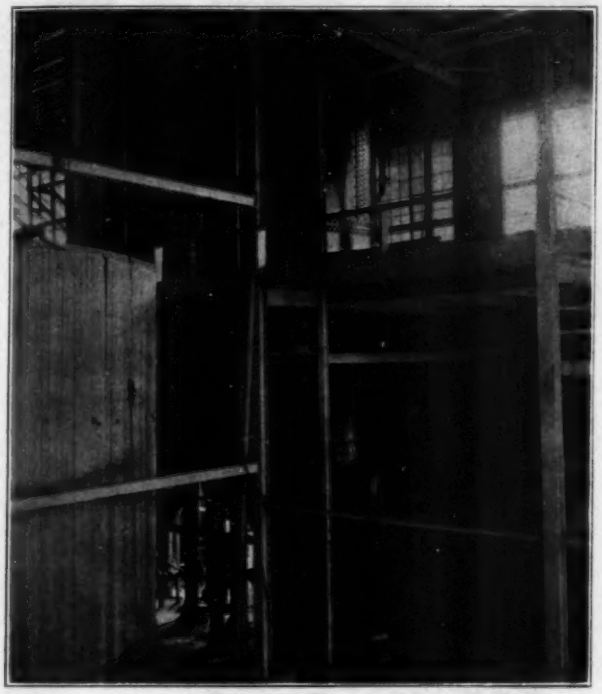
We will appreciate opportunity to give detailed information regarding the above machines as well as of our many other specialties for the manufacture of pulp and paper.

We are Sole Manufacturers of the machines particularly mentioned above as well as of most of our other specialties.

Baker Manufacturing Corporation

SARATOGA SPRINGS, N. Y.

84 inch wet machines and two single deckers were furnished by the Valley Iron Works. The latter also installed three 2000 pound Niagara beaters, three 10x12 triplex stuff pumps and



Interior view of digester house of Columbia River Paper Mills, showing the two 49-ft. digesters

two No. 2 P.A.P.A. inward flow screens for the paper machine. The centrifugal pumps were supplied by Cameron Steam Pump Works.

The paper machine is a Bagley and Sewall, 136 in. wide, designed for paper production of 150 to 600 feet per minute and is driven by Westinghouse sectional drive. This drive consists of a 200 KW Westinghouse M. G. set, together with a 3 KW and 15 KW exciter set and the control board mounted near the wall between the rewinder and the finishing room.

The paper machine is 212 feet long and consists of a suction couch driven by a 125 H.P. motor, three presses each driven by a 60 H.P. motor, a dryer consisting of 32-48 inch dryer rolls driven by a 90 H.P. motor, and one calender which is driven by a 90 H.P. motor. Each motor drives its section of the paper machine by means of a Link-Belt machine. The operation of the paper machine is controlled entirely from conveniently located push button stations. The rewinders were furnished by the Kidder Press Company and the sheet cutters by the Hamblet Machine Company.

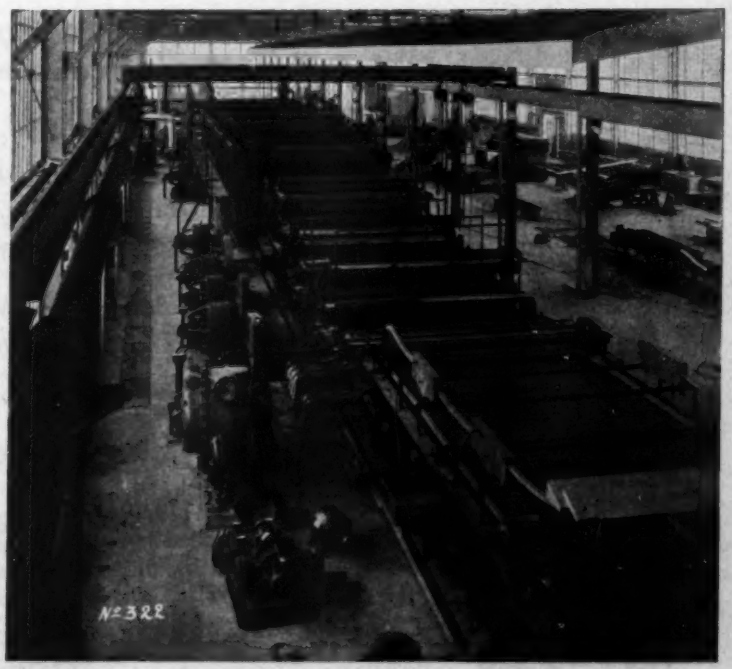
Fruition of Early Plans

The idea of building a paper mill in Vancouver, Washington, was generated in the minds of President F. W. Leadbetter and Henry L. Pittock, pioneer paper manufacturer of the Pacific Northwest, nearly twenty years ago, at which time they purchased the old sawmill there, which was located near the site now occupied by the Columbia Paper Mills' modern plant, and incorporated the Pittock & Leadbetter Lumber Co. After increasing the capacity of the sawmill from 40,000 feet daily to a maximum capacity of 200,000 feet daily, the company's operations were disrupted by fire, which completely wiped out the entire plant.

One of the three 2,000 pound Niagara beaters installed at the Columbia River Paper Mills

Although a small sawmill was afterward built, a fine boiler and planing equipment installed which would operate to serve both the paper mill and sawmill, and even a paper machine ordered for the contemplated Vancouver plant, it was decided to install the machine, which had been ordered, at the Camas plant of the Crown-Columbia Company—now the Crown Willamette Company.

The Cutler-Hammer Mfg. Co. of Milwaukee announces the addition to their Industrial Sales Engineering force of the Eastern district of Mr. T. E. Beddoe, at one time connected with the Pittsburgh and Chicago offices of the company. He is now located in the Philadelphia office. Mr. Paul Darlington, for the past four years in the Industrial Controller Engineering Department at the Milwaukee factory, has also joined their staff and will be located in New York.



View of the drive side of the Bagley & Sewall paper machine in the Columbia River Paper Mills, showing Westinghouse Sectional Drive.

THIS OR THIS

Ordinary Furnace Wall

C-E Fin Furnace Wall

C-E Fin Furnace Walls Reduce Boiler "Outage"

C-E Fin Furnace Walls are composed of water tubes connected into the boiler circulation.

Ratings ranging from 461% to 603% have been carried on boiler equipped with C-E Fin Furnace for 11 months without damaging the furnace walls. Boiler evaporation has been increased and efficiency improved.

C-E FIN FURNACE WALLS

are insurance against damage from high boiler ratings

INTERNATIONAL COMBUSTION ENGINEERING CORPORATION

Combustion Engineering Corporation

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Offices in Principal Cities Throughout the World

Frederick Multiple Retort Stokers
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Type K Stokers
Type H Stokers
Self-Contained Stokers

Green Chain Grate Stokers
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Green Pressure Waterbacks
Quinn Fuel Oil Equipment
C-E Fin Furnace

Lopulco Pulverized Systems
Coxe Stokers
Grieve Grates
Air Heaters
CEC Tube Scraping Device
Combusco Water Seal Conveyers

Ohio News

December 1, 1924.

Meeting of Miami Valley Divsion of Supts.' Assn.

The monthly meeting of the Miami Valley Division of the American Pulp and Paper Mill Superintendents' Association was held at the Manchester Hotel on Saturday evening, November 29th, Chairman Lloyd T. Murphy presiding, with about fifty members and guests present.

Mr. R. W. Jenkins of the Ohio State University, who is on the Committee of Vocational Education, made a brief report on the progress that is being made in their work, which is progressing very satisfactorily. Some classes have already started in the Miami Valley, and others are forming and will be started during the month of December. Foreman's classes are also being started in many of the mills and the outlook is very encouraging.

Norris Talks on Electric Drives

Mr. R. N. Norris of the Harland Engineering Co. of Canada was present and gave a very interesting talk on the subject of "Electric Drives on Paper Machines." He illustrated his remarks with lantern slides.

He went into detail on many of the features, and others were explained in passing. Among the points he brought out, Mr. Norris stated that in one change from the old way of driving to the electrical way the even speed of the machine has been maintained. The installation made on one machine in 1914 with a speed range of 10 to 1 has never been changed to this time. There are two motors on dryers, one motor on other section, motor on calenders and one on winder.

There is no desirable feature obtainable by a mechanical drive that cannot be achieved by this drive. There are many desirable features obtained that no mechanical drive can give nearly so well or at all.

With this speed inter-lock, as Mr. Norris termed his system, the speed is constant, with simple readjustments, and with perfect speed control, which is very reliable. One of the points he brought out along this line was, with belt drives on flat-face pulleys the usual allowance for stretch and slip on full load is three percent, while with conepulley a higher slip is expected. The slip on a belt decreases with decreasing load, and vice versa. To take a conservative estimate, assume that the machine is running with 2 percent belt slip and 1 percent draw between two sections, and that the load on one section increases 25 percent. In that event the slip will increase 25 percent and the draw, which was 1 percent, becomes 1½ percent or increased 50 percent. This is one of the causes of the sheet not being uniform in strength, and in many cases is the cause of breaks, which means loss of production.

Another big factor in the electric drive is the safety of the employes, who are at times placed in many dangerous places with the mechanical drive, to make a temporary repair or some adjustment while the machine is running. He cited one case where a life had been saved, when an operator slipped and his boot passed in between the press rolls, the motor overload tripped and he escaped with but slight injury to his foot.

In the electric drives the elimination of friction clutches, pulleys, belts or ropes used in the drive, line shafts in basement and on machine floor, together with a very large amount of floor space, is quite a big item of expense, to say nothing of the cleanliness that is maintained about the machine by the use of the electric drive.

Complete independent control being secured by the fact that each section is driven by its own motor. Each motor is provided with a switch by means of which the machine men can cut out that part without interfering with the other parts of the machine.

Motors can be placed either inside or outside of the machine-room. Those placed inside of the machine-room are ventilated, and are of waterproofed type, while those placed outside of the machine-room can be of semi-enclosed type.

Along the line of upkeep, Mr. Norris stated that it was a small item compared with the items of belting, rope, gears and many other items that are necessary on mechanical driven plants. Contacts, brushes like parts of the motors are the small items that enter into the electrical drives.

He also stated that the life of the wires, felts, etc., on the machines have shown longer life, as the speed of the draw is steady at all times.

After Mr. Norris completed his talk, many questions were put to him by various members, which proved a very interesting discussion.

New Members Enrolled

Mr. William MacGregor of the Bemis Bag Co., Peoria, Ill., and Mr. Field of the Cheny Pulp and Paper Co., at Franklin, Ohio, were enrolled as members, while Mr. W. F. McClellan was transferred from the Connecticut Valley Division.

He is now connected with the Auglaize Box Board Co., at St. Marys, Ohio.

The next meeting will be held on the second Saturday in January, as it was deemed best to suspend the December meeting on account of the Christmas holidays. This meeting will be held in Dayton, Ohio, and the subject for the evening will be upon "Rubber Covered Rolls," which will be led by a representative of one of the large Eastern mills. Mr. H. G. Funsett of the Hager Strawboard and Paper Co. and Herbert W. Server of the Miami Paper Co. were named on the committee for arrangements. Mr. Homer C. Ferguson, first vice-chairman, will head the committee on arrangement of speaker and program for the evening.

Mr. J. A. Krebs and Mr. Sperling of the Hammermill Paper Co., at Erie, Pa., were among the members present from a distance.

Gardner Harvey Club's Plans

Reorganization of the club, signing of new players and plans for an improved ball park are outstanding propositions in the report of the Gardner Harvey Baseball club, champions of the K. I. O. League, and representative of the Gardner & Harvey Paper company, to K. I. O. headquarters in Cincinnati. The Papermakers were the first to submit its list of newly elected officers to headquarters.

The new officers include W. B. Hadley, president; H. L. Dibble, first vice-president; A. B. Morgan, second vice-president, and Fred Schneider, third vice-president. The post of secretary was given Fred Roberts, while Ed Geran was re-elected treasurer. Hadley served as manager of the club last year while Dibble functioned in the executive post. Roberts was last year's successful business manager.

The Gardner Harvey nine is expected to present an even stronger front in 1925. A big laegue pitcher, who is on the voluntary retired list, will be engaged to assist Al Leake. This move was made necessary by the entrance of the team into the twilight baseball division for the next season.

The Gardner Harvey park will be enlarged. An entire new grandstand is being erected, which will seat 2,500, while bleachers will be installed along both base lines.

Fire at Leshner Company

A fire in the building of the Leshner Paper Stock Company of Cincinnati, November 15, caused damage to the extent of $75,000. The location of the company, in a deep ravine east of State street, was a handicap to the firemen, who were forced to slide down the steep banks to stretch their lines of hose.

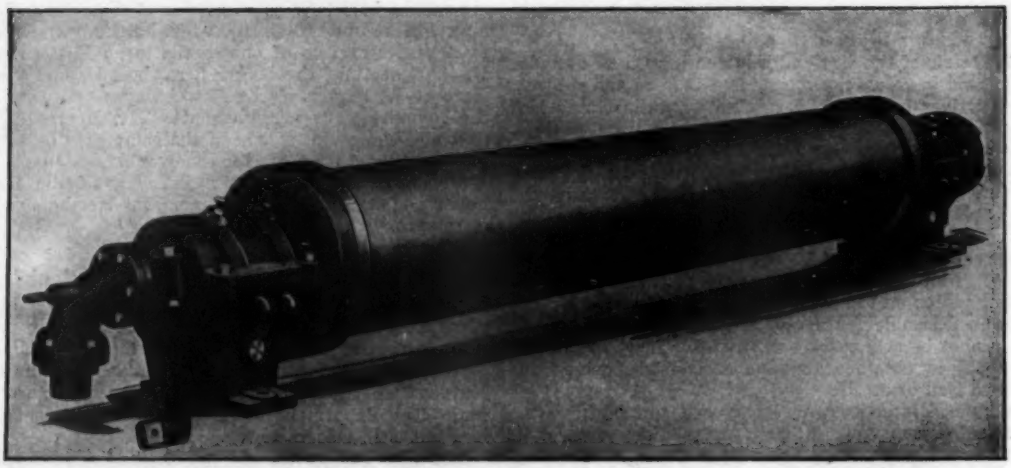
The Leshner company is a subsidiary of the Philip Carey Manufacturing company, Lockland.

H. T. Ratliffe, traffic manager of the Champion Coated Paper company of Hamilton, was re-elected president of the Hamilton Traffic Council at the annual meeting of the organization.

Everett Dechant, 51 years old, familiarly known as "Toby" of Franklin, Ohio, died at his home, November 19, at 11:30 p. m. Dechant was an employee of the Sorg Paper Mills in Middletown for many years.

The Joint Committee on Approved Chemists of the American Paper and Pulp Association has recently approved for listing Mr. Wilhelm Mattsson, Box 107, Port Alfred, P. Q., Canada.

No Adjustments Required



Patents applied for

Kilberry SUCTION ROLL

POINTS OF SUPERIORITY

Common-sense bearings about one-half diameter of shell. Infallible alignment of suction box to shell, no adjustments required. No wear on packings, therefore no replacements required. Direct jaw clutch connection to driving shaft, no gears. Less power to drive roll.

DOWNINGTOWN MANUFACTURING COMPANY

Paper Mill Machinery

P. O. Box 8 **EAST DOWNINGTOWN, PA.**

Mail Coupon for full description and prices

COUPON

Downingtown Mfg. Co. (P. O. Box 8)
East Downingtown, Pa.

( ) Send information on Kilberry Suction Roll.
( ) Send your complete catalog of Paper Mill Machinery.
(Check item desired, no obligation.)

Company .....

Personal Name..... Title .....

Address .....

Canadian Section

December 1, 1924.

Canadian Paper Trade Association Holds Annual Convention

At the seventh annual convention of the Canadian Paper Trade Association, recently held in Toronto, merchants and mill men from most parts of Canada came together to discuss topics mutually interesting to all departments of the industry. The meetings, which were presided over by John Larkin of Montreal, resulted in the adoption of uniform trade customs, the decision to drop the Long Price List, resolutions on relations between the paper merchant and the manufacturer, and resolutions touching on forest conservation.

The Long Price List has been in use by the paper trade for two years and now the Association has advised the Toronto Typothetae that the next lists issued will be on the net basis. The Typothetae declare that they will not relinquish the use of the Long Price List and are prepared to fight for its retention. Just what form the fight will take has not yet been determined, but the president of the Toronto Typothetae has called a meeting of his executives to consider the proper steps to take.

The chief guest at the convention and at the annual banquet was N. E. Shoenbucker of the Research Committee of the National Paper Trade Association, who delivered several addresses on economical subjects as affecting the paper trade and printing industries. The chief representative of the mill men was George Carruthers, president of the Canadian Pulp and Paper Association, and president of the Interlake Tissue Mills, Limited.

The following officers were elected for the ensuing year: President, R. I. Finlay, president of the United Paper Mills, Ltd., Toronto; first vice-president, E. A. Schofield of the Schofield Paper Co., Ltd., St. John, N. B.; second vice-president, A. C. Hunt of the John Martin Paper Co., Winnipeg, Man.; treasurer, E. S. Munroe of the Wilson-Munroe Co., Toronto; secretary, N. L. Martin, Toronto.

The Educational Committee of the Canadian Pulp and Paper Association, consisting of George Carruthers, president of the association, T. L. Crossley, A. P. Costigane, and C. Nelson Gain, held a meeting in Toronto in the early part of November, and plans were considered for the promotion of the work in the industry.

Price of Newsprint May Drop Further

Some little time ago it was announced that the price of newsprint during the whole of the coming year would be $70 a ton, and now $65 is being mentioned in certain quarters. Such a cut in price would appreciably reduce the profits of Canadian companies. Several new mills contemplated, along with the discussion regarding these intended establishments, have not served to strengthen the newsprint market.

Many investment bankers are resigned to the prospect of $65 newsprint, and it would not be surprising to see the market dip to this figure before showing recovery. It is reported that some investment bankers are wondering if $65 newsprint would not in the end be a good thing for Canada by eliminating some of the weaker and higher cost mills. In conservative newsprint circles, a 1925 price of $68 a ton is considered altogether probable, while other interests very close to the trade, both in Quebec and in Ontario, who have been remarkably accurate in former predictions, believe that a drop to $65 a ton is by no means improbable before bottom is reached. In this connection, report is current that one Quebec producer which figures its costs this year on an estimated figure of $68 for newsprint is lining up its production plans for 1925 on a $65 selling basis.

There is a strong possibility of such a thing as overproduction and too rapid development of the newsprint industry in the Dominion, which has done so much to keep the Canadian dollar at par and preserve the balance of trade. The weak spot in the whole situation is the large additional tonnage which will be produced in 1925.

In other quarters, on the other hand, it is considered that, though some of the smaller mills might drop their price to $65, the large producers will abide by the $70 rate which was announced some little time ago.

Arrangements have been made for electric light and power to be supplied to the town of Nipigon, Ont., from the Nipigon Fibre and Paper Mills. Seventy homes and stores have already signed a contract.

Winding Up Fraser Pulp and Lumber Company

Recently the Fraser Pulp and Lumber Company, which, although it is owned by the same shareholders as the Fraser Companies, Limited, has no connection with that company, sold its large timber holdings in the province of Nova Scotia for several millions. Having sold its properties, the company is being wound up, and its assets are being distributed among the shareholders, as it has ceased to be an operating company.

Fraser Pulp and Lumber, however, should not be confused with Fraser Companies, Limited, which is doing a large business in pulp and lumber in eastern Canada, and is this year extending its operations considerably, including the construction of a new mill on the Quisibis.

Safety Engineer Visits Northern Ontario

A. P. Costigane, Toronto, Engineer of the Ontario Pulp and Paper Makers' Safety Association, has returned from an extended trip to the pulp and paper mills at Iroquois Falls, Smooth Rock Falls, and Kapuskasing. He found much interest taken in safety work at Smooth Rock Falls, a well equipped hall with a moving picture outfit has been erected, and safety meetings will be held by the employees of the Mattagami Pulp and Paper Co., Ltd.

At Kapuskasing there is an interesting accident prevention competition in progress for a trophy offered by Mr. Hoyman, safety engineer of the Kimberly-Clark Co., and considerable interest has developed in the contest.

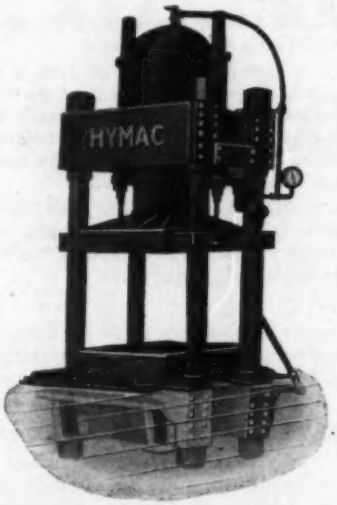
At Iroquois Falls, safety conditions in general were discussed with the special committee and plans for an intensive campaign are under way among the employees of the Abitibi Power and Paper Co., Ltd.

It had been reported some time ago that the Bathurst Company, Ltd., Bathurst, N. B., were contemplating the installation of a second paper machine. Angus McLean, president of the Company, has announced that they have no intention of proceeding with the installation at the present time, as the conditions in the paper industry are too uncertain just now. Mr. McLean says that all the company's plans are being operated at full capacity at the present time.

Norman Dam Dispute Not Yet Settled

The matter of the reconstruction and control of the Norman Dam, which regulates the level in the Lake of the Woods, is still in abeyance. It had been reported some time ago that an agreement which was satisfactory to all parties had been reached, but this was never confirmed by the Dominion Gov-

PULP PRESSING



PULP PRESS

THE illustration shows our standard 600 Ton INVERTED PRESS for wet laps; it is the type in general use throughout Canada.

A Dry Test of "60% Air Dry" may be obtained on ground wood or sulphite pulp.

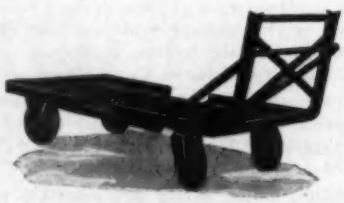
We also make Upward Pressure Presses of equal or less capacity.

PULP BALER

THIS illustration shows our Standard 100 Ton PULP BALING PRESS.

This Press is used for baling the pressed laps as they come from the pulp press above shown.

It will be noted that a scale is provided, the beam of which is set for the desired weight of pulp. This eliminates labor for weighing and extra handling.



PULP TRUCK

THE above illustration shows our Standard PULP TRUCK. This is loaded by the wet Machine tender and enters the Press — when the load has been pressed the cart is driven to baler or car — one handling of pulp is all that is necessary.

We also make the necessary Pumps, Accumulators, Valves and Fittings that go to make up a complete Hydraulic Pressing Equipment

THE HYDRAULIC MACHINERY CO., LIMITED

MONTREAL, QUE.

ernment. In a recent interview, after a conference with Premier Ferguson of Ontario, Hon. Charles Stewart, Minister of the Interior at Ottawa, explained the situation as follows:

The agreement which was reached between the Dominion Government and the Backus interests, and which was satisfactory to the Ontario Government, provided for the construction of a new dam at the outlet of the Lake of the Woods, on plans and specifications prepared by the Dominion Government. The work of constructing the dam was to be performed by Backus, but the control of the waters of the lake through the new dam was to be in the hands of the Lake of the Woods Conrtol Board. In short, the dam, while it was to be the property of Backus, was to be controlled by the Ontario and Dominion Governments. The Manitoba Government, however, objects to the ownership of the dam remaining with Backus, even though the control of the waters remained with the governments.

E. W. Backus is president, of the Fort Frances Pulp and Paper Co., Ltd., which has a 150-ton newsprint mill at Fort Frances, Ont., and also of the Backus-Brooks Co., which has a 100-ton newsprint mill at Kenora, Ont. He is also understood to be interested in the proposed erection of a newsprint mill by the Great Lakes Paper Co., at Fort William. He intends spending about $3,000,000 in the construction and repair of the Norman Dam.

A provincial charter has been granted to Nipigon Products, Ltd., with an authorized capital of $500,000, one-half of which will be preferred shares. The head office of the company will be at Fort William, and the organization is empowered to carry on business as timber merchants, loggers, pulp and mill activities, and allied lines.

No Further Developments in Riordon International Situation

The Wall Street Journal recently announced that arrangements for taking over properties formerly belonging to the Riordon company were being made by International Paper Co., and that financing the acquisition would take the form of a bond issue of around $10,000,000 or $12,000,000. In answer to this President Graustein of International Paper announced that, although International is considering the possibility of acquiring the Riordon properties, it has as yet neither decided to do so, nor settled any basis for their purchase.

It is expected that if these plans should materialize, International would erect a 400 to 600-ton newsprint mill at Chelsea, a few miles from Ottawa, on the Gatineau River, where sufficient hydro-electric power could be developed to run a mill of this size, and leave a balance for sale.

It is reported that the legislature of the province of Quebec may pass more restrictive forest legislation during the coming session. Now that it has established a school to train experts in forestry, the legislature will take more energetic means for protecting the forests. A commission may be appointed to investigate conditions.

Newsprint Production to Benefit Wayagamack

When it was announced that the Wayagamack Pulp and Paper Co. was about to produce newsprint, its 6 per cent first mortgage bonds were quoted at about 80. In a short time they rose to 84 and remained firm at that figure. It is interesting to note that the rise occurred on a comparatively small transaction, only $66,000 (par value) of bonds changing hands within three weeks.

Those acquainted with the situation and resources of the company say that it is in an exceptionally favorable position to produce newsprint at a low figure, and it is evident by the recent activity and rise in their bonds that the news that the company was going into the newsprint field created a most favorable impression.

At a special general meeting of the shareholders held at the head offices of the company at Three Rivers, on November 27th, the directors were authorized to go ahead with the incorporation of a subsidiary company, to be known as Wayagamack News, Limited, the capital stock of which will be owned and controlled by the parent company. A meeting of the board of directors was held immediately afterwards at which were initiated the requisite steps to be taken in this connection.

It is understood that the program just ratified will be carried out with all speed and that the construction work will be started early next spring.

Wood and Pulp Processes, Ltd., have been incorporated under an Ontario provincial charter. The main purpose of the Company's organization is to acquire from the Lumber Securities Corporation of the United States, a corporation of the State of Delaware, certain Canadian patents, about fifteen in number, covering processes for: (1) treating wood; (2) manufacturing pulp; (3) manufacturing equipment used in connection with these processes; and (4) collection of by-products from the pulping process.

Abitibi's Working Capital

Officials of the Abitibi Power and Paper Co. do not agree with the general opinion that the company is short of working capital. It is pointed out that the company's logging railroad was built out of earnings, and consequently made substantial inroads into apparent working capital. At the same time, however, completion of this road obviated the necessity for an eighteen months' gap between the cutting of pulpwood and its departure from the mill in the form of newsprint. Thanks to the railroad, tieups in woods and rivers have been eliminated, and pulpwood is going in a steady stream right from the limits to the mill and the newsprint markets.

In this way a very substantial saving is effected and the company, it is claimed, consequently does not require nearly as large a proportion of working capital to handle its cut as do the majority of other newsprint producers.

W. G. Mitchell, manager of Price Brothers and Co., at Kenogami, nearly lost his life by asphyxiation towards the beginning of last month, when he closed the doors of his garage and started the engine of his car. The exhaust gas from the engine quickly spread through the garage and only by a fortunate circumstance was Mr. Mitchell found lying on the floor before the gas had an opportunity to finish its deadly work.

Survey of Branch Line Started

Canadian National Railway gangs have been out for some time making a survey of the proposed route for the branch line from Kapuskasing to Smoky Falls, Ont., and it is likely that construction work will start at an early date. The line will be used for the transportation of pulpwood for the large paper mill which the Kimberly-Clark interests are reported as contemplating erecting at Kapuskasing, where they already have a 130-ton easy-bleaching sulphite mill.

The development of 60,000 horsepower at Smoky Falls (to be subsequently increased to a possible development of 200,000 horsepower) is involved also in the plan. It is said that the latter job will be begun immediately.

Dominion Envelope and Carton Co., 150 Duchess Street, Toronto, have been very busy of late, and recently purchased an adjoining parcel of land, the buildings on which are being wrecked in order to clear the way for the erection of an addition, which will be used chiefly for centralizing their warehouse accommodation.

Opposition to McArthur Interests

Trouble is being stirred up in Winnipeg over the proposed sale of pulpwood areas sufficient to produce three million cords, such areas to be chosen within a period of five years from a 40,000 square mile tract in Manitoba. Opposition to the scheme is based on the ground that it is an alienation of

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The view above shows a New Frederick Stoker installed in the boiler room of a large central station. This plant has installed four 14-retort Frederick Stokers under 1608 h.p. boilers.

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the public resources, and that it would drive all the small mills operating through Manitoba out of business, thus throwing nearly 1,000 men out of work.

Settlement has been reached between the McArthur interests and the opposing lumber and timber interests. Among the conditions to which the parties have agreed, the McArthur Co. will be allowed to select its requirements from any part of the province; but this selection must commence from the southern part of the province and continue northward. Also, small timber interests operating in the province will not be interfered with.

The agreement has been submitted to Premier John Bracken, who has promised to give it careful consideration. Ratification by the Federal Department of the Interior will be sought later.

Construction of a wood barking and wood loading plant will be started early next spring by the Mont Lewis Lumber Co., Ltd., a subsidiary of the St. Regis Pulp and Paper Co., at Mont Lewis, Gaspe, Que. Two 10 by 30-foot barking drums, furnished by the Canadian Barking Drum Co., will be installed, also one of their American bark presses.

Among interesting reports affecting the pulp and paper industry current in Quebec City is one to the effect that the forecasted agreement between Price Bros., Ltd., and the St. Regis Paper Co. is soon to become a fact. It is said in this connection that shortly before his death Sir William Price and Mr. Carlyle, who headed then respectively the two firms, had manifested the intention of coming to some terms. If the report proves accurate, the new mills to be built at Cap Rouge, eight miles from Quebec, by the St. Regis, would likely be the first link between the two organizations.

Senator Curry to Pay Pulpwood Dealer

Mr. Justice Melliss, in the Supreme Court of Nova Scotia, recently awarded $23,100 and costs to Daniel Chisholm, manager of the Sheet Harbor Lumber Co., who brought action against Senator Curry, of Amherst, N. S., for that amount in respect to commissions alleged to be due to Chisholm for sales of pulpwood tracts to Messrs. Ingraham and Moore, New York.

Senator Curry claimed that the sale had not been made to Mr. Moore, with whom Chisholm was in touch, but to Mr. Ingraham through Senator Curry himself. The claimant declared the two were purchasing the tracts jointly, and the court decided in his favor. Mr. Moore gave evidence and stated that he was Mr. Ingraham's partner.

The Canadian Barking Drum Co. are installing a 10 by 30-foot barking drum at Sonora, N. S., for the West Virginia Pulp and Paper Co. They also recently shipped six 10 by 30-foot drums to Newfoundland Power and Paper Co., Corner Brook, Newfoundland.

Hale and Hearty at Eighty-Six

George H. Millen, president and manager of the large E. B. Eddy Co., Ltd., plants at Hull, Que., celebrated his eighty-sixth birthday recently. In spite of his advanced age, Mr. Millen is to be found daily at his office, where he does a good day's work. When he arrived at his place of business on the morning of his birthday, he found two beautiful bunches of flowers; one of them, containing eighty-six splendid American Beauty roses, was from the counting house staff of the Hull office, while the other from the staffs of the company's offices in Winnipeg and the prairie provinces, contained eighty-six carnations.

Mr. Millen has been connected with the Eddy Company for the last fifty-eight years, having started with it in 1866. For a long time he was the right-hand man of the founder, the late E. B. Eddy. His health is good; indeed, he appears to be as hale and hearty as he was twenty years ago.

Executive officers of the Abitibi Power and Paper Co., Ltd., Iroquois Falls, Ont., recently called on Premier Ferguson in Toronto to complete arrangements for the construction of the power dam at the Long Sault Rapids, on the Abitibi River, some distance from their mill, where they will develop approximately 30,000 horsepower. This will be used at the mill, and will permit of increasing the capacity from 500 tons a day to between 800 and 1,000 tons a day.

Dan Daverin Takes Charge of Lennox Mills

The Lennox Paper Mills, of Camden East, Ont., which have been in liquidation and shut down for some months, will again be put in operation and turn out book and envelope papers. The plant has been acquired by interests headed by L. F. Houpt and W. E. Houpt, of Buffalo, N. Y., and the manager will be Dan Daverin, of Thorold, for many years superintendent of the Montrose division of the Provincial Paper Mills.

Before his departure Mr. Daverin was tendered a farewell banquet by a number of his friends and presented with an appreciative address and a beautiful Masonic ring. Mr. Daverin has always taken an active interest in baseball and other sports, and his departure from Thorold, where he resided for eleven years, is greatly regretted.

Another Record Output for Port Alfred Mill

Reports regarding Port Alfred Pulp and Paper Corporation indicate another record month, its output for October having reached 4,427 tons, as compared with a previous high of 4,336 tons. Shipments for October total 6,389 tons, representing the largest monthly volume in the history of the business.

It is also understood that the Port Alfred Corporation has made important progress in the matter of production costs, which in October were considerably lower than in September, and which have now been stabilized at a very low level. The company is maintaining its position as one of the lowest cost producers of high-grade sulphite on this continent. One year's wood supply is now on hand at the mill, and the 1924-25 supply has been contracted for at prices considerably lower than those prevailing during the present year.

Hon. James Lyons, Minister of Lands and Forests in the Ontario Government, was confined to the Toronto General Hospital for some days as a result of injuries received when his car skidded into the ditch on the Dundas Highway near Erindale, early last month. Hon. Mr. Lyons was rather badly shaken up, although no bones were broken.

Capacity Output at Smooth Rock Falls

The Mattagami Pulp and Paper Co.'s mill, at Smooth Rock Falls, Ont., turned out on an average of 190 tons per day of No. 1 unbleached sulphite during October, the total production for the month being 4,700 tons, and it is expected that November production will run about the same.

Only about 10 per cent of the output is being marketed in Canada, the balance being disposed of in the United States. The company have contracted for 100,000 cords of wood this winter, about eighty per cent of which will come from settlers.

A. H. Black, president of the Great Lakes Paper Co., Fort William, Ont., now operating a large pulp mill, announces that his company plan the erection of a paper mill next year, with a capacity of 100, and possibly 200, tons of newsprint daily. They will commence breaking ground for the new mill in April, and plan to have it in operation in April, 1926. The company is now using 7,500 horsepower and when the paper mill is in operation will require 20,000.

Eddy Improvements Progressing Rapidly

The very extensive changes and enlargements being carried out at the mills of the E. B. Eddy Co., Ltd., Hull, Que., are proceeding quite rapidly. The new paper mill, a structure over 600 feet long, including train shed, finishing, machine and mixing rooms and steam plant, has attained its full height,

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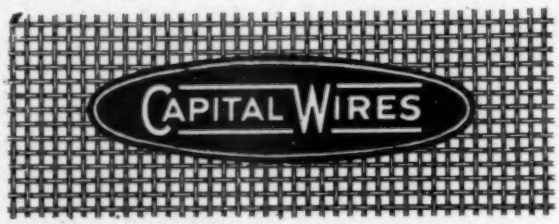

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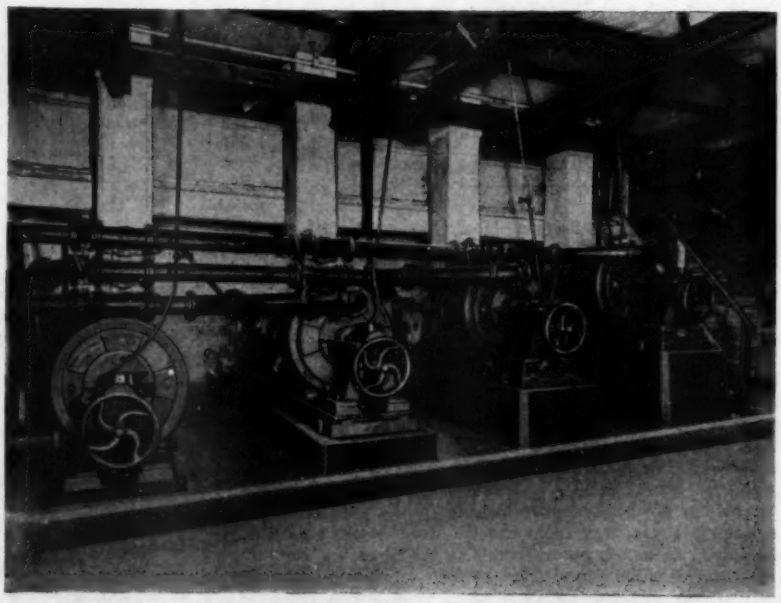

NOBLE & WOOD MACHINE CO., Hoosick Falls, N.Y., U.S.A.

Canadian Builders: Port Arthur Shipbuilding Co., Ltd.,
PORT ARTHUR, ONTARIO

interior and roof steel is in place and final work on the roof decks, together with interior installation, is now in progress. The paper mill buildings are being constructed to receive one 234-inch high speed machine with electric drive; but they are designed for two machines, with provision being made for two further installations.

The sulphite mill extensions and improvements, consisting of two additional digesters, 15 feet by 47 feet, with new screen, blow pit, bleach and knotter rooms, is completely under roof and the installation of equipment is now being carried on. Acid plant improvements, including rearrangement of the burner room, with new gas coolers, acid handling and storage system, are nearing completion.

Buildings for a new drum barker installation at the sulphite mill are practically completed: two 12x30-foot drums are to be accommodated at the start, with provision for additional units. Rearrangement of the present layout is now proceeding, and includes the elimination of knife barkers and the installation of new chippers and chip screens, together with relocation of slashers and log haulups.

Groundwood will be supplied to the new paper mill by means of a pipe line which will follow the new railway siding extension. Groundwood will thus be supplied direct, in slush form, from the groundwood mill to the paper mill, a distance of about three-quarters of a mile.

Committees are actively engaged in arranging for the annual meeting of the Canadian Pulp and Paper Association, which is to take place in Montreal at the end of January. Several widely known speakers have been secured for the annual banquet, and this year's gathering promises to be of more than usual interest to the Canadian pulp and paper industry. No hint has yet been given as to who will head the organization next year.

T. J. Stevenson, president of the Riordon Sales Corporation, recently delivered an address before the Rotary Club of Montreal on "Wood Sulphite in the Manufacture of Wearing Apparel." The address was illustrated with samples of sulphite at different stages in its manufacture, and also with samples of finished viscose silk. A film was also shown of the operations of the Riordon Corporation, which showed the manufacturing process from the time the logs are cut in the forest until the finished pulp is loaded on the cars and shipped out of the pulp mill.

Nashwaak Co. Again Wins Suit

It is not yet known if the Canadian National Railways will appeal to the Privy Council re the decision of the Supreme Court of Canada, disallowing the appeal of the Canadian National from the judgment of the Exchequer Court in favor of the Nashwaak Pulp and Paper Co.

The suit was instituted in 1920 and damages of $25,000 were claimed because of loss of a locomotive that had fallen with an embankment. The railway claimed the loss of the engine had been caused by the weakening of the Nashwaak River bank by a jam of logs belonging to the pulp and paper company. When the jam broke, the bank fell in, and the engine went into the river.

Two years ago at a sitting in Fredericton, the Exchequer Court ruled in favor of the Nashwaak Co., holding that this concern was not liable for the damage. The railway carried the appeal to the Supreme Court, with the result mentioned above.

Big Grinder Order for Waterous

The Waterous Engine Company of Brantford, Ont., has secured from Price Bros. & Co., Ltd., Quebec, one of the largest pulp and paper manufacturers in Canada, an order for fourteen Voith caterpillar grinders, for which Waterous recently secured the Canadian manufacturing rights.

The construction of these machines will keep the plant busy 22 hours a day until early spring.

E. R. Buscombe, who for some years has occupied a responsible position in the purchasing department of E. Pullan Ltd., rag and paper stock merchants, Toronto, has received a well-merited promotion and will shortly move to Ottawa, where he has been appointed manager of the Capital Paper Stock Co., an organization recently taken over by the Pullan interests. Mr. Buscombe is held in high esteem by his firm and by the large section of the paper trade in Toronto with which he has come into contact, and his many friends predict that he will make good as head of the Ottawa business of the company.

It is expected that the two new newsprint machines that are being built for the St. Maurice Paper Co., at Three Rivers, Que., will be operating by the beginning of the New Year. They will add about 75 tons each to the output, bringing the total up from 120 to about 270 or 275 tons a day. This will be done with less expense than attends such work generally, for St. Maurice has a surplus production of groundwood and sulphite which will be used by the new machine.

Shawinigan Has New Power Project

The Shawinigan Water and Power Co., Ltd., which is already one of the largest producers of hydro-electric power in the Province of Quebec, and which supplies several of the large pulp and paper mills in the St. Maurice Valley, is going ahead with another new power development on the Batiscan River at St. Narcisse. At this point the company's subsidiary, North Shore Power Company, has already a development at present producing 1,200 horsepower. The new development will have an installed capacity of 20,000 horsepower, with the possibility of being increased later on to 30,000 horsepower.

The development is an interesting one from many points of view. Among others, the transmission line of the present plant, installed in 1893, was the first long distance, high tension transmission system in the British Empire, having been established to transmit power to Three Rivers, a distance of approximately eighteen miles.

Low water conditions on the St. Croix River, New Brunswick, said to be almost without parallel, are crippling industry. The St. Croix Paper Co.'s big mills at Woodlands have had to curtail their output as a result of lack of water to operate their mills. There has been little or no rain in the district since early in September, and the St. Croix River is in a most unusual state for this season of the year. A few days' rain towards the end of November did not improve the situation to any great extent, but at least prevented conditions from becoming considerably worse.

Price Bros. & Co., Ltd., have awarded to the Dominion Bridge Co., Montreal, the contract for supplying the structural steel required in the construction of their new news print mill at St. Joseph d'Alma, Que.

South African Dumping Duties on Paper Repealed

Advices have recently been received by the Canadian Pulp and Paper Association, from G. R. Stevens, Canadian Trade Commissioner for South Africa, at Capetown, that the regulations there with regard to dumping duties on paper from Canada had been repealed. This, it was stated by Edward Beck, manager of the Candian Pulp and Paper Association, is the result of a fight extending over a considerable period between the Canadian paper interests represented in South Africa and the local interests there.

The change affects chiefly Kraft wrapping paper, exported from Canada to South Africa. To assist a Kraft paper mill established in South Africa in 1918, a duty of a cent a pound was imposed on Canadian paper products, and slightly more on those from outside the empire. It was found that this was not sufficient to altogether exclude foreign paper products, and the "dumping" regulations were imposed to make it more effective.

South Africa imports about 7,000 tons of wrapping paper

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We will gladly refer you to mills using the Fulton System and making the same grade of paper as you. They will tell you their experience with the Fulton System.

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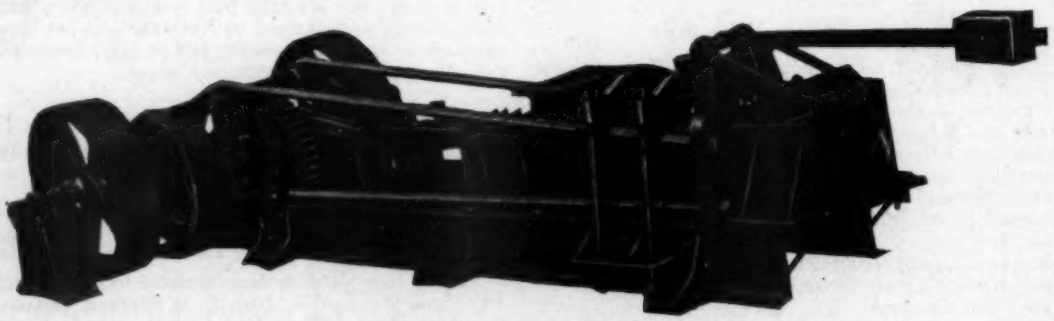

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per year, of which Canada supplies about 2,000 tons, the rest being imported from Scandinavia. It was shown that changing the duty system would result in transferring this trade from Empire to other countries.

Reports from the South African representatives of the Canadian Pulp and Paper Association set out that the investigation showed that the Canadian Kraft was not only superior to anything produced in South Africa, but was recognized as the standard of excellence throughout the world.

A Toronto paper man who was recently at the Booth mills, in Ottawa, was called into a conference with J. R. Booth and a representative of a big coal concern a short time ago. The transaction involved a coal contract amounting to about $100,000 and at the conclusion of the conference, according to the Toronto paper man, the coal man stated that he thought he had acquired most of the knowledge pertaining to the coal business, but that Canada's aged but active lumber and pulp king had taught him many things he never knew before. It was the coal man's testimony that Mr. Booth displayed a remarkable grasp of the coal situation both past and present, and that his mind was just as keen as ever.

The news print mill of Price Bros. & Co., at Kenogami, Que., which was recently shut down on account of the floods and landslide in which Sir William Price lost his life, resumed operations a few days later, at fifty percent of its capacity. The damage was not as extensive as had been thought at first, and the mill is now working at full capacity.

Judgment in Favor of Price Bros. Maintained

Early last spring, Price Bros. & Co., Ltd., won a petition of right against the Government of the Province of Quebec in connection with the delimitations of the seignory of Little Metis, Justice Gibson of the Superior Court setting as the limits of that seignory, on which Price Bros. have rights, the territory surrounding Lac Nitis, Lac à Lacroix, and Lac Anguilles. The provincial government, on the other hand, had contended that only the limits around the upper lake were subject to the Price Brothers' privileges.

In view of the fact that over $500,000 was involved in the case, appeal from this judgment was entered, and the appeal was heard in the first days of October last. Judgment has just been rendered by the Court of Appeals, upholding the judgment of the Superior Court in favor of Price Brothers.

Indications are that the mill of the Albany Perforated Wrapping Paper Co., at Sheet Harbor, N. S., will be producing pulp by the latter part of December or not later than the latter part of January. At present about 300 men are employed in the construction work.

Price Mills to Be Closed on Sundays

In reply to a request from Premier Taschereau of Quebec, the Price interests have stated their willingness to co-operate to the fullest extent in enforcing observance of the Lord's Day.

Orders have already been issued to the heads of the mills at Kenogami to cease work on Saturday at midnight and close the mills until midnight on Sunday, starting January 1st. The delay in ceasing Sunday work is due to certain repairs which are absolutely necessary at and in the vicinity of the mills. This is especially true in connection with the recent landslide, where much work had to be done before the frost set in.

The Poupore Lumber Co., Ltd., of Ottawa, has been granted a charter with a capital stock of $300,000 to carry on logging, lumbering, pulp and paper activities.

St. Maurice Paper Liable for Loss of Fingers

Poking a match into a detonator used for setting off explosives cost Emile Lanoue four fingers, but because he did not realize the danger attending his act, and for other reasons, he is entitled to damages in the sum of $2,280, according to a unanimous judgment handed down recently at Montreal by the Court of Appeals, division of five judges.

Lanoue, who was eighteen years old when the accident happened, claimed damages from the St. Maurice Paper Co., Ltd., declaring that he had sustained the injury while employed by the company, and in the execution of an order received from one of its representatives. In defence, the St. Maurice Paper Co. declared that the young man was not working for them at the time of the accident, but for a third party. It was further pleaded that the plaintiff was not injured while at work, but while he was playing with the detonator and that furthermore the accident was caused by the youth's own inexcusable fault. It was further alleged by the company that the plaintiff had not suffered any permanent incapacity.

The plea was dismissed by the Superior Court at Hull, and the company was condemned to pay $2,280 to Lanoue. The company's appeal has now been rejected by the Court of Appeals in Montreal.

In reference to the rumor that the Spruce Falls Co., of Kapuskasing, Ont., are planning to harness Smoky Falls, in the Timagami River, and have a branch of the Temiskaming and Northern Ontario Railway constructed from the main line along the Abitibi River to Smoky Falls, and that eventually a large newsprint mill will be erected. E. J. Jones, general manager of the company, says that the reports appearing in the press are largely speculative, and that there is nothing definite known as to when any future development will be made by the company.

An incipient blaze which started in the plant of the Interlake Tissue Mills, Limited, at Merritton, Ont., a couple of weeks ago, communicated itself to the sprinkler system. There were no damage to the plant or machinery, but some stock was water-soaked and partially destroyed.

Provincial Paper Enjoys Good Year

The total sales of the Provincial Paper Mills, Ltd., Toronto, which closes its fiscal year next month, will, it is expected, amount to about $5,500,000 for the past twelve months. It is believed that the forthcoming financial statement will show a fair increase in earnings over last year. The company will have the advantage of the Port Arthur mill for the full year, where as last year this plant was in operation for only part of the period. This unit has a daily capacity of 40 tons of groundwood, 60 tons of bleached sulphite, and 35 tons of book paper.

The company's earnings this year will show a surplus over the common dividend, and there is every reason to believe that it will continue to pay the seven per cent on the preferred shares and at least 6 per cent on the common.

Final arrangements are said to be under way for the new financing which will be carried out by the St. Maurice Paper Co., Ltd., proceeds of which will provide for the considerable expansion which is being carried out in the company's manufacturing facilities. It is understood that the issue will take the form of $2,500,000 of short-term five per cent bonds, and that offering will be formally announced in the near future.

Biermans Favors Embargo

H. Biermans, president of the Belgo-Canadian Paper Co., Shawinigan Falls, P. Q., in a recent interview stated that the export of pulpwood threatened the life of the paper industry in Canada. Uneven competition between the Canadian and American pulp and paper manufacturers, he claimed, would result in the virtual extinction of the industry in Canada and the denudation of her forests unless an embargo was placed on the export of pulpwood from the Dominion.

He declared emphatically that pulpwood when manufactured into paper is increased in value seven times and more, and that the manufacture of Canadian wood in the States meant a consequent loss of approximately $60,000,000 a year

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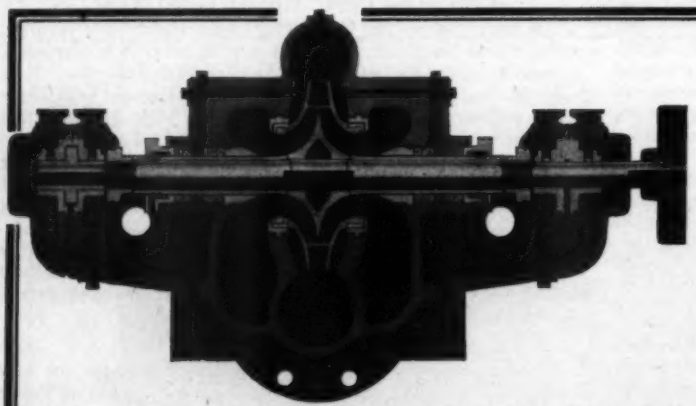

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If you are considering pumps for capacities between 300 and 3,000 G. P. M. and heads 70 feet and below let us quote you on the improved type "S" pump and you will be surprised to see what small size motors can be used. The saving with a 6" pump is around 4 H. P. or approximately $180.00 for 3,000 hours' pumping.

ALLIS-CHALMERS MANUFACTURING CO.

Milwaukee, Wisconsin, U. S. A.

to this country. Side by side with this existed the fact that a potential source of work for Canadians was being ignored, with the result that to do work that ought well be done here Canadians had to leave Canada and cross the border.

A federal charter has been granted to Ritchie & Ramsay, coated paper manufacturers, Toronto, Ont., with an authorized capital of $1,000,000. The new charter supersedes the provincial one under which the company has been operating for over thirty years, being the oldest concern of its kind in Canada.

Further Appeal Dropped

The Bathurst Co., Ltd., of Bathurst, N. B., who appealed against the assessments of the Workmen's Compensation Board, and carried the fight through the courts for some years, were defeated in their case, as noted in these columns some time ago. The company won their suit in the two courts in New Brunswick, but when the board appealed to the Supreme Court at Ottawa the company lost.

Angus McLean, president of the company, states that they would have taken the matter to the Privy Council, but the law in New Brunswick was changed by the legislature last winter, so that even if the Bathurst Co. had won their suit at London they would still fall under the provisions of the act as amended, and so the appeal was dropped.

Mr. McLean adds that as matters now stand, lumbermen are badly handicappead owing to the high charges under the compensation act in the province, and he says that "It is certainly a serious detriment to the lumber industry and, in fact, to all employers, not only in the lumber but in the pulp and paper business in New Brunswick, to be penalized as we are at the present time because of the heavy charges that are imposed upon us."

As a part of the formalities necessary to the reorganization of the securities of the Lincoln Mills Co., Merritton, Ont., the courts in Toronto recently granted an application for permanent liquidation of the company. In the meantime, the company are operating satisfactorily and gradually increasing their output.

At a general meeting of the Dominion Commercial Travellers' Association, J. Pierre Rolland of the Rolland Paper Co., Ltd., Montreal, was elected president for the ensuing year, by acclamation.

Machine Making Wide Range of Papers

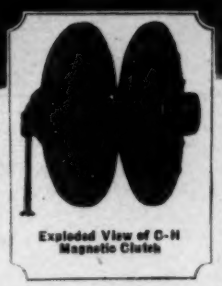
It is usually customary to use a Harper Fourdrinier machine to make light weight papers. At the Interlake Tissue Mills in Merriton, Ont., however, where in addition to tissue and toilet paper they also make wrapping, news and wallpaper, a standard Fourdrinier machine is used on which a felt is provided to take the paper from the couch through the first press. Papers varying from 10 lbs. to 120 lbs. in basic weight are made on the machine.

The sheet is taken from the couch by the felt and carried on the under side until it comes to the first press, through which it passes back in the reversed direction with the sheet on the top side of the felt. At the first press it is picked up by the second felt, carried over the top press roll and through the rest of the machine in the usual manner.

The Abitibi Pulp & Paper Company, Iroquois Falls, Ontario, Canada, plans an addition to their pulp and newsprint mill estimated to cost three million dollars. George F. Hardy, 309 Broadway, New York City, is the consulting engineer.

Mr. Thomas Linsey Crossley, 28 Lonsdale Road, Toronto, Ontario, has recently been approved for listing by the Joint Committee on Approved Chemists of the American Paper and Pulp Association.

The Whalen Pulp and Paper Company is planning construction of a newsprint mill at New Westminster, B. C.



Exploded View of C-H Magnetic Clutch

On Synchronous Motor Drives

With the C-H Magnetic Clutch the load is picked up without jar. There is just enough slippage while the magnetic force is building up to reduce the shock of starting.

This clutch makes it possible also to employ a synchronous motor which, having practically no starting torque, is brought up to full speed before the clutch is engaged. This type of motor has advantages which make it desirable to use for raising the power factor of the electric system and reducing the power cost.

The C-H Magnetic Clutch requires small space and may be located below floors, in pits, overhead, or (since no attention is required) in inaccessible locations. Control stations may be located wherever convenient for attendants.

On a tissue paper machine drive a 30-inch C-H Magnet Clutch was installed on the floor below with control switch on the floor above. Production was increased and depreciation on felts greatly reduced. As a result all machines of this mill are equipped with these clutches.

At the Neenah Paper Co. mill a C-H Magnetic Clutch prevents the over-speeding of mill drive when the mill load is reduced or removed, the engagement and disengagement of which is controlled by a centrifugal governor.

The Northern Paper Co. uses two 66-inch clutches on magazine pulp grinders; Thilmany Pulp & Paper Co. has 16 on paper machine drives; The Frank Smith Paper Co. uses 7; Paper Converting Co. has 3 on paper machines and 4 on paper reel drives.

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Increased toughness combined with increased cushion are found in the new

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Stand up longer between grinding—They take out more water—
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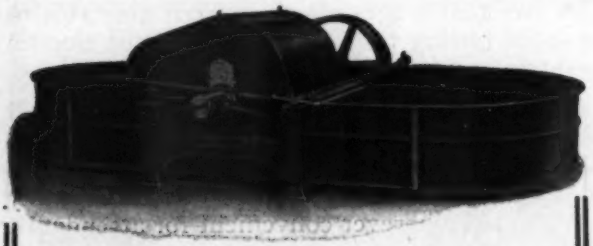
Top and Bottom Wet Felts for board machines, with all the qualities requisite to insure long life and continuous production.

They Satisfy



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Dayton Beater and Hoist Co.
DAYTON, OHIO

Pickles' Patent Automatic Steam Regulator
FOR
Paper Making Machines

Which absolutely control the drying of the sheet. Installed on sixty days' trial

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Northern New York News

December 1, 1924.

Seek to Recover Carthage Tract

An effort to include a $24,000 tract of timberland in Gaspe county, Quebec, owned by the Carthage Sulphite Pulp and Paper Co., in the property of that concern taken over by the United States Mortgage and Trust Co., in the foreclosure of its $500,000 mortgage, was made in Federal court before Judge Cooper.

The timberland was recently sold by Charles E. Norris of Carthage, receiver of the concern, for $24,000, under an agreement by which the money was turned over to the court for determination as to its possible attachment as an asset of the concern. The attorneys for the unsecured creditors contend that inasmuch as the mortgage was never registered in the province of Quebec, it does not cover any of the property of the company located there.

The Raquette River Paper Co., of Potsdam, last spring planted 250,000 Norway spruce and white spruce transplants on its land, according to a report made by the state conservation commission. Stanley M. Sisson, assistant manager of the woodland division of the company, declared that both species were growing well and that not more than three to five per cent of the total number set out failed to survive. Mr. Sisson said that next spring the company intends to set out from 250,000 to 500,000 spruce and red pine.

Plans for the construction of a storage reservoir on the Raquette River, capable of impounding about twelve billion cubic feet of water, have come to light in connection with recent court proceedings. The reservoir, it is said, will probably be constructed by the J. B. Taylor interests and proceedings are being watched with interest by the Floyd L. Carlisle paper and power group which has large holdings along the Raquette River at a point below the proposed development.

The timber lands of the St. Regis Paper Co., located in Lewis county, were seriously menaced by the forest fires which swept through the Adirondacks during the early part of November. Part of the tract was burned over, but the fire was gotten under control before extensive damage was done.

Will Ask for Duty on Newsprint

Northern New York newsprint manufacturers will be heard before the ways and means committee of the new congress in an effort to have a duty imposed on newsprint, in order to stop the present large importations from Canada, which has resulted to a considerable degree in price cutting within the last few months. While it is too early to estimate with any degree of accuracy as to what action the committee would take to such proposals, if history be any criterion, opposition from the newspapers and publishing houses will prevent serious consideration of the measure.

The situation is still further complicated by the fact that many of the big paper manufacturing companies are gradually moving their mills to Canada to take advantage of the nearness of the timber lands and lower manufacturing costs. Such American paper manufacturers are, of course, opposed to any tariff on newsprint, because it would be a duty on their own product, practically their entire production being sold in this country.

This situation was brought out at the time of the hearings on the Fordney tariff, when Floyd L. Carlisle, head of the St. Regis group, sent a communication to the committee in opposition to a duty on newsprint. So far as pulp is concerned, the wood supply in this country has decreased to such an extent that there would probably be little agitation for a duty on either pulp or pulp wood. American manufacturers are dependent almost entirely on Canadian wood and a duty would simply result in raising production costs here. When the Fordney tariff was being considered in committee, there was comparatively little agitation for a newsprint tariff and few protests were heard when it was put on the free list. With

TRADE
CAMACHINE
MARK
ROLL-WINDERS

Well Worth While—

is this recommendation of CAMACHINE-18 by Mr. Kindleberger:

"Our big winder that is just installed and now running is immensely satisfactory. We consider the buying of this big machine a wise and economical move. The boys running this winder wear a smile that won't come off—something that I have not seen in this mill for years. Parchment Paper is the hardest paper to run over the winder that there is, and this new winder seems to do the trick without any trouble.

"We just cannot help but feel very thankful to you for making a winder that will do the work so nicely.

"Sincerely yours,

"KALAMAZOO VEGETABLE PARCHMENT COMPANY,

"(Signed) J. KINDLEBERGER."

WORDS of praise and approval for work faithfully done are incentives to continued effort. Mr. Kindleberger knows this secret and is generous-minded enough to apply it. Any one of his phrases would make the ordinary testimonial—"immensely satisfactory," "a wise and economical move," "smile that won't come off," "without any trouble," and "feel very thankful to you."

The machine he bought is shown in the illustration above. It is CAMACHINE-18, the modern mill type winder. What it is doing in Mr. Kindleberger's mill it can do in yours. Will you allow us to figure on equipment to suit your particular needs? Your request will bring an immediate written or personal response from us.

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61 POPLAR STREET BROOKLYN, NEW YORK

BE READY FOR THAT PIPING JOB

When the emergency job arises or there is a change to be made in the piping, be prepared to handle the work easily and quickly.

You can do it with "Toledo" threading and cutting tools, and you will be surprised at the ease and speed with which the work can be accomplished.

"TOLEDO" No. 1A
Threads 1" to 2"
List Price $30.00

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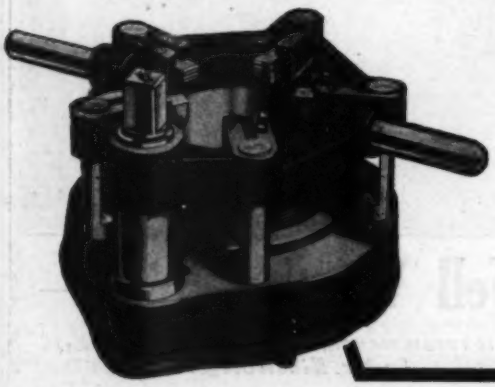

"Toledo" pipe threading and cutting equipment is the last word in pipe tools. They are portable, easy to operate, one-man tools that will reach the most inaccessible piping jobs.

They will quickly prove their worth about the paper mill.

A post card will bring you our complete catalog.

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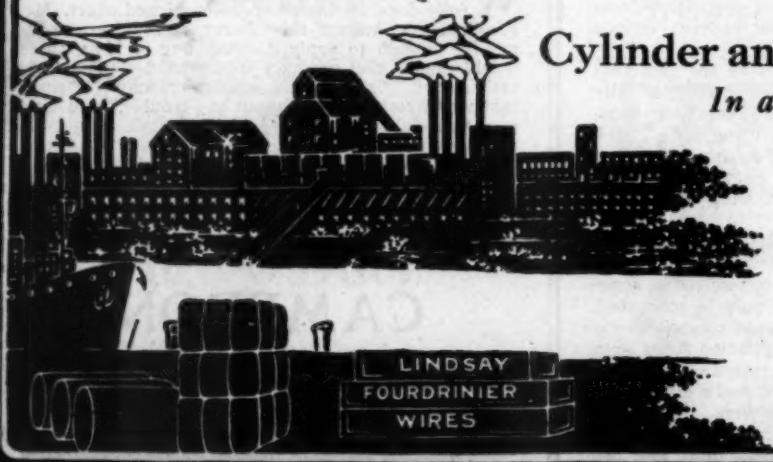
LINDSAY WIRES
are
DURABLE AND DEPENDABLE
Made in all sizes



Cylinder and Washer Wires
In all Meshes

The Lindsay Wire Weaving Company
Collinwood Sta. Cleveland, Ohio

the trade divided and the newspapers opposed, there was not enough sentiment. Since that time, however, many paper mills here are closed and most of the rest are running on reduced capacity. The paper industry has reached such a crisis that stronger efforts may be expected in the direction of a duty.

Thaddeus C. Sweet, president of the Sweet Bros. Paper Manufacturing Co., of Phoenix, was elected representative from the 32nd New York congressional district. Mr. Sweet was elected last year to fill the vacancy caused by the death of Luther W. Mott, and this election he was elected for the full term. Mr. Sweet, who is a Republican, was speaker of the New York state assembly for several years and is well known in paper manufacturing circles.

With the Stillwater reservoir on Beaver River nearing completion, manufacturers of paper in this section are turning to the proposed Moose River reservoir, which will probably be the next project under the New York State Regulating Board. The Moose River is a tributary of the Black River, and it is proposed to build a reservoir holding about four and a half billion cubic feet of water at a cost of about three million dollars. The reservoir would necessitate the building of a dam, 115 feet high and 900 feet long.

John A. Lloyd, of New Hartford, employed by the Sauquoit Paper Co. and the Adirondack Tissue Paper Co. for the last eight years as general sales manager, has accepted a position with the Regal Paper Co., of Pulaski, as general sales manager.

Will Recommend Progressive Forest Policy

The Empire State Forest Products Association and the New York State Forestry Association will recommend to the state legislature the enactment of a policy similar to that in Massachusetts, exempting land planted to forests from any extra tax until the cutting of trees is begun. The passage of such a law would permit the farmer with waste or semi-waste land, to plant it to trees without the danger of increased taxation until the trees had reached their growth and cutting had begun.

The organizations also endorsed the proposal to increase the number of state nurseries, so that sufficient seedlings can be developed to supply the needs in the state. The committees are in favor of planting more trees on state land. During the past year 9,500,000 trees were put out by the state and the prospects are that 12,000,000 will be set out next year.

The Empire State Forest Products Association went on record as favoring active co-operation with the Federal Government under the provisions of the McNary-Clark forestry act. George W. Sisson of Potsdam was elected president of the Association, and John N. Carlisle of Watertown, first vice-president and chairman of the board of directors.

Damage Suit Against DeGrasse Co. Being Heard

The first of a series of important actions against the DeGrasse Paper Co. are being tried in Canton, before Judge James C. Dolan as referee. The case is that of Murray Dodds as plaintiff. John Jackson, president of the DeGrasse Paper Company, came from New York to personally defend the suits. The plaintiff claims that 54 acres of his land along the Grasse river, in the town of Canton, are damaged yearly from pulp which flows into the river from the defendant's mill at Pyrites. The defendant claims that the damage comes from other sources. A great deal of expert testimony was taken to determine the nature and cause of the alleged damage.

President Jackson of the DeGrasse Paper Co. holds that the case is a most important one, intimating that an unfavorable decision might result in the closing of the mill and the throwing of 450 men out of employment.

A storage reservoir, on the Oswegatchie River, impounding three billion cubic feet of water, will be built in the vicinity of Newton Falls within the next few years. Private interests, of which the Northern New York Utilities, Inc., is the prin-

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Installation of 4 De ZURIK WASHERS at Watab Paper Co., Sartell, Minn.

A new type converted stock washing and deinking machine requiring but 12x36 feet floor space, being only 15% of that required by old type washers of same capacity. The stock is much cleaner and no power is used but that for pumping stock and water. Operation is entirely by gravity. Upkeep and operation costs are very low.

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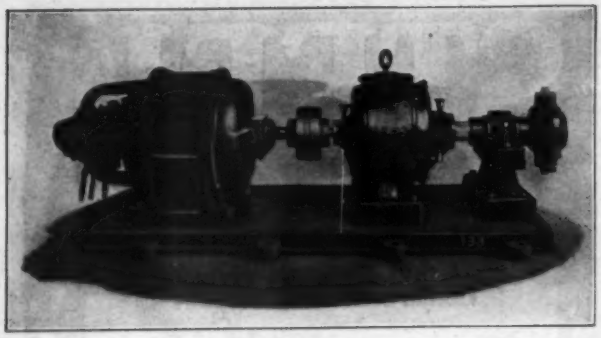
Sartell, Minn., U. S. A.

Manufacturers of De ZURIK white and fresh water nozzle showers



Ganschow Type "A" Speed Transformer Complete with Motor, Baseplate and Outboard Bearing.

There's a Type for Every Service

ONE type of speed transformer is not applicable to all conditions, and the additional standard types which we have designed and built in large numbers have opened up a wide field of new applications for speed transformers.

All three standard types are built upon one general principal, which has been modified only to meet varying drive requirements. They are all fully covered by patents.

All are capable of the same consistently high efficiency under the most unfavorable conditions, and require no care or attention except occasional lubrication.

Type "C".

The Type "C" Speed Transformer is identical in internal design to the Type "B" and is modified in the construction of the housing. It is used extensively on all sorts of vertically driven machinery, and may be arranged to drive either up or down. It requires no provision for motor suspension and the consequent heavy thrust bearings to take the weight of armature, etc.

"There's a Type for Every Service"

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The Stickle system of removing air and condensation from the dryers, combined with the Stickle automatic control of steam, will produce a more uniform dried sheet with less steam consumed than can be done with any other equipment. We will guarantee this under a competitive test.

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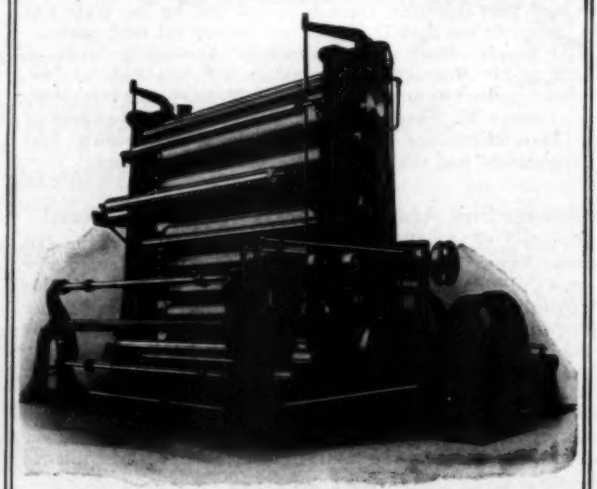
NORWOOD
SUPER CALENDERS



WE ARE SPECIALISTS IN

Paper Finishing Machinery

NORWOOD ENGINEERING CO.
FLORENCE, MASS., U. S. A.

cipal factor will build the reservoir. The Utilities is one of the holdings of the Carlisle group, owner of the St. Regis Paper Co. and subsidiary companies.

Investigating Union Funds

Matthew Burns, secretary of the International Brotherhood of Paper Makers, is conducting an investigation of the funds of that organization. No charge is made that any one benefited by any transaction, but it is declared that the accounts are badly mixed and legal action may be necessary to straighten them out.

The brotherhood at the present time is in the midst of an active campaign to bring about a more general use of the union label on all rolls and bundles and asking members of the printing pressmen's union to insist that such paper be used. The campaign is directed against the International Paper Company which is now in its third year of a fight with the brotherhood.

The case of the Wood Grinding Service, Inc., against the International Burr Corporation for alleged infringement of patent, is being heard in United States district court at Albany.

The New York State Court of Appeals, the highest in the state, has reversed the verdict in the case of Anthony Vittorio against the St. Regis Paper Company. Vittorio, arrested for the alleged theft of some felts from the defendant's mill at Deferiet, was acquitted and sued the company for false arrest. Lower courts sustained Vittorio and awarded him $150. On appeal, however, the decision was reversed, dismissing the complaint with costs amounting to about $700, which Vittorio must pay.

Raquette River Co. Installing Bleaching Equipment

The Raquette River Paper Co. is now installing a new bleaching system in their mill at Potsdam, N. Y. The first unit of the new equipment consists of a rotary bleaching boiler furnished by the Biggs Boiler Works of Akron, Ohio, a wood washer, by the Glens Falls Machine Co. and an electro-bleaching gas absorption system for making up the bleach liquor.

A new type of pump furnished by the Viking Pump Co., of Cedar Falls, Ia., is being tried out, which it is expected will pump stock at a density as high as 6 percent. The capacity of the new bleaching plant will be from 15 to 20 tons daily and will carry out the bleaching at a density of 15 percent or higher. The plant is expected to be operating by the first of the year.

Raquette River Paper Co. Entertains

Following their usual custom the Raquette River Paper Company recently entertained their friends in the paper trade at Potsdam and on the annual hunting trip to Raripaco Lodge at Granshue in the Adirondacks.

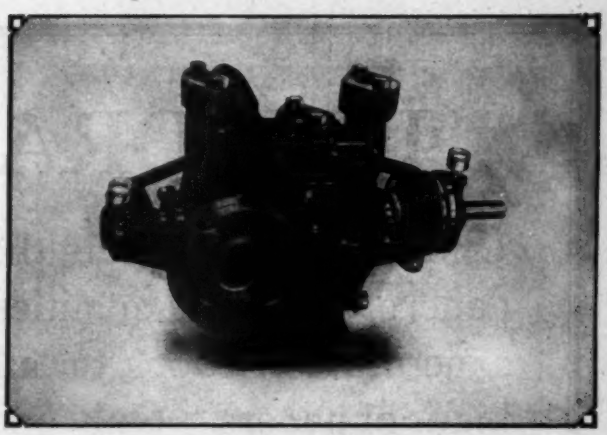
After spending a day in Potsdam inspecting the mill the company moved to Raripaco Lodge and enjoyed a day of hunting. This proved a real treat to most of the guests, who living in cities seldom have an opportunity to enjoy the woods in the fall of the year.

About forty guests were present on the hunting trip.

Pulp and Paper School Adds to Its Equipment

The Pulp and Paper School at the New York State College of Forestry has recently made some additions to its experimental equipment. A complete experimental pulp and paper mill is arranged on a long soapstone bench extending in the shape of a V. Starting with the raw chips the regular processes are carried out to make the finished sheets of hand-made paper.

Starting at one end of the bench, four small experimental digesters are installed. Two of these are used for cooking sulphite pulp, one for soda pulp and the other for sulphate and lime. The cooked stock is passed through a wash pit and



Jennings Hytor for removing the condensate and air from paper mill dryers

Keeping the dryers at the proper efficiency

THE only way to keep dryers at the proper efficiency and thus to insure correct drying is to provide an effective means for rapidly and regularly removing the condensation and air.

Syphons have a tendency to trap air in the dryers that results in irregular drying; dippers cause a waste of steam during one-half of every dryer revolution, when the steam blows straight out through the drip pipe.

The Jennings Hytor avoids all these difficulties. It consists of two turbine units, an air pump and a water pump, combined in a single casing. It is positive in action, and reliable in operation. In fact, it removes the condensation vapors and air from the dryer in the same way and just as efficiently as the Jennings Hytor Vacuum Heating Pump removes the water and air from the radiators in a return line house-heating system.

For complete information, write for descriptive literature.

NASH ENGINEERING CO.

So. Norwalk **Connecticut**

BRANCH SALES OFFICES IN: Atlanta, Boston, Buffalo, Chicago, Cleveland, Dallas, Denver, Detroit, Houston, Indianapolis, Los Angeles, Minneapolis, New Orleans, New York, Philadelphia, Pittsburgh, Portland, Richmond, St. Louis, San Francisco, Washington. IN CANADA: Montreal, Toronto, and Vancouver.

Jennings Hytor

RETURN LINE AND AIR LINE VACUUM PUMPS CONDENSATION AND CIRCULATING PUMPS

2012-38

THE DRAPER FELT

Unexcelled for strength, openness, resiliency, and general running qualities. Made to meet the most exacting conditions on all types of machines and all kinds of papers. Only one grade and that the highest.

Made by

DRAPER BROTHERS COMPANY

CANTON, MASS.

Woolen Manufacturers Since 1856

REPRESENTATIVES

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FOURDRINIER WIRES

Dandy Rolls *Cylinder Molds*

Brass, Copper and Iron Cloth

Bank and Office Railings

WIRE SIGNS

Cheney Bigelow Wire Works

Established 1842 SPRINGFIELD, MASS.

if it is desired to make up sample sheets of pulp a sheet machine is provided for this purpose. Two small beaters, one a Noble & Wood and the other a Niagara, prepare the stock. A diaphragm screen is provided to screen either the pulp or paper.

As it is necessary to dilute the stock for screening a wire basket catches the screened stock and thickens it. After screening, the stock is taken to the vat to form the sheets on the hand mould. The sheets of paper are then pressed and dried on a 54-inch electric dryer of the type used for drying blue-prints.

Lawless Brothers Paper Mills, Inc., report the purchase of the boxboard mill located at Scottsville, formerly operated by the Scottsville Paper Box Board Corporation and Flower City Tissue Mills Co., Rochester, New York. The mill was built in 1918. The company has been incorporated under the name of the Genesee Paper Mills, Inc., and will be under the management of Mr. Joseph Eilers of Norwich, Conn., who has had a wide experience in high-grade boxboard manufacture. Single and double lined, light patent coated, specialties and other high-grade boxboards will be manufactured.

The Robert Gair Co. has placed contracts with the Austin Co. for the erection of a 7,000-ton waste paper stock house at their Piermont Division, Piermont, N. Y., to take the place of their stock sheds destroyed by a recent fire. The stock house will be equipped with overhead cranes and will allow the paper bales to be stacked 10 feet high. There will be railroad tracks on all sides. Karl A. Lefren of New York is consulting engineer.

New York City News

December 1, 1924.

Flintkote Mill Destroyed by Fire

Fire destroyed the plant of the Flintkote Company, Inc., manufacturer of roofing paper, in Little Ferry, N. J., on November 17, with a loss estimated at between $75,000 and $100,000.

The fire was discovered on the second floor of the mill in a pile of rags, and spread quickly. Seventy-five employes hurried to safety, and firemen had a hard job subduing the blaze, six nearby towns sending apparatus to battle the flames. The Flintkote mill had a capacity of 130,000 pounds per 24 hours of flooring felt, saturated and building papers.

Waste Merchants Dinner February 3

In keeping with its custom, the Waste Merchants Association of New York, whose membership includes nearly all of the prominent dealers in paper mill supplies in this district, will give its annual reception and dinner this winter during the week of the convention of the American Paper and Pulp Association in New York.

Tuesday evening, February 3, has been selected as the date for the dinner, which will be served in the large ballroom of the Hotel Commodore. This dinner is always one of the events of "Paper Week" in New York and is usually attended by a good many paper mill men who are in the metropolis for the convention.

The Aldine Paper Mills, Inc., has been organized and incorporated under New York State laws with a capital of $15,000 and with H. E. Goldberg president. Offices of the new concern are at 1270 Broadway, New York, and its warehouse is at 541 West Thirty-fourth street. Mr. Goldberg formerly was with the Baldwin Paper Mills, and disposed of his interests in that company to organize the new firm. W. J. Clements, who has had broad experience in selling paper in various parts of the country, has been appointed sales manager of the Aldine Paper Mills, Inc.

Board Man's Home Robbed

Jewels valued at $12,000 and $187 in cash were stolen on the night of November 14 from the home of J. L. McEwan on Morristown Road in Whippany, N. J., during the period

RHOADS
Watershed Tannate Belts
will do it economically

THE above belt was installed in June, 1923. It is a heavy double Rhoads Watershed Tannate on a Dryer and Yankee cone of a Fourdrinier machine. The cones are 50″x49″ and 39″x40″, speed 2,000 F. P. M.

This drive is in a paper mill that had long used rubber and other fabric belts, and believed leather belts unsatisfactory and expensive.

The superintendent, doubtless influenced by our guarantee, told a Rhoads salesman to send along the above belt, remarking to his wheelwright, "Let's teach these people something about paper mill drives." The belt is still running well and is in excellent condition.

Other paper mill men have been just as sure leather belts would not do, until they tried Watershed Tannate. The Rhoads guarantee covers these belts, even on the hardest paper mill drives.

J. E. RHOADS AND SONS

PHILADELPHIA.....47 North Sixth St.
NEW YORK.....114 Beekman St.
CHICAGO.....334 W. Randolph St.
ATLANTA.....80 Forsyth St.
Factory and Tannery: WILMINGTON, DEL.

A common waste that CAN be cut out

According to the late Charles P. Steinmetz the best that modern method can do is to extract 20% of the heat from fuel. It certainly behooves us, then, to spend that much carefully.

THE auxiliary or process that is getting your boiler's full steam pressure when its actual requirement is far less than that amount is one of the reasons for the big coal bill. The Davis Pressure Regulator furnishes the means for reducing those pressures, and the annual saving that comes from cutting those pressures a third or half is astonishing.

Its utter simplicity and good design and workmanship make it most dependable. It operates noiselessly. Its action is visible, and it can be tested by hand.

Where shall we send your free copy of the Davis Catalog fully describing this and the rest of the Davis line? Address the G. M. Davis Regulator Co. at 414 Milwaukee Ave., Chicago.

DAVIS VALVE
STEAM SAVERS SINCE 1875
SPECIALTIES

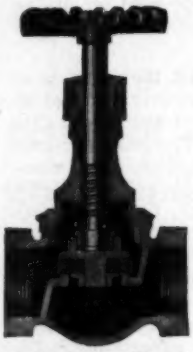
PI-12F-RTG

Made for maximum service not merely the average

TRADE JENKINS MARK

Jenkins Bros

Jenkins Discs are convenient



Sectional view, Fig. 106, Jenkins Standard Bronze Globe Valve, fitted with Jenkins Renewable Disc.

Renewing the disc in a Jenkins Valve is easily accomplished, without removing the valve from the line.

Jenkins Renewable Composition Discs are made of flexible composition that adjusts itself to the valve seat and makes a tight, leak-proof joint when the valve is closed.

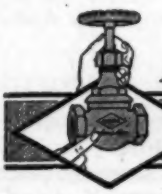
Jenkins Discs are regularly furnished for steam, water, gas, and air service. Special discs to meet almost any conditions.

Specify service when ordering Jenkins Valves or Discs. At supply houses everywhere.

JENKINS BROS.

80 White Street.....New York, N. Y.
524 Atlantic Avenue.....Boston, Mass.
133 No. Seventh Street..Philadelphia, Pa.
646 Washington Street.....Chicago, Ill.

JENKINS BROS., LIMITED
Montreal, Canada London, England

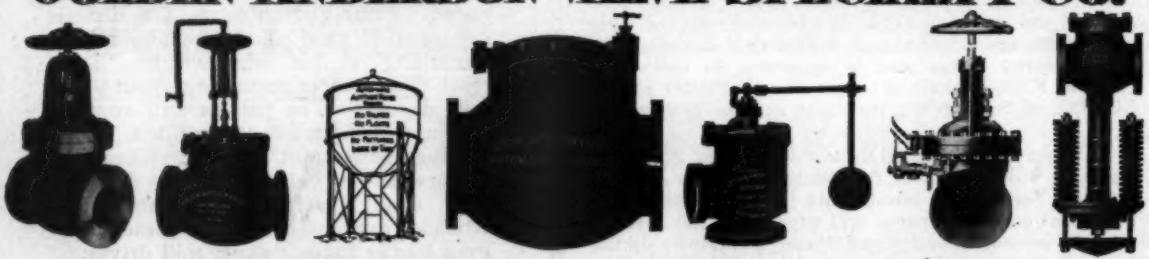


Always marked with the "Diamond"

Jenkins Valves

SINCE 1864

GOLDEN-ANDERSON VALVE SPECIALTY CO.



AUTOMATIC CUSHIONED STEAM AND WATER-SERVICE VALVES.
"We Challenge to Test for Merits Any Automatic Steam or Water-Service Valves in the World"
1240 FULTON BUILDING. PITTSBURGH, PA.

WE-FU-GO AND SCAIFE

WATER

PURIFICATION SYSTEMS
SOFTENING & FILTRATION
FOR BOILER FEED AND
ALL INDUSTRIAL USES

WM. B. SCAIFE & SONS CO., PITTSBURGH, PA.

of an hour when the family had driven to Morristown. Mr. McEwan is one of the owners of the McEwan Bros. paper board mills in Whippany, whose payroll of $7,000 was taken in a holdup last month.

The thieves gained entrance to the McEwan home by means of a ladder to the second story bedroom of Mrs. McEwan. They had confined their attention to this room and, it is believed, were interrupted by the return of the family.

Two damaging fires occurred in the waste paper trade in New York in November. On November 20 the plant of the Gowanus Waste Material Company, Inc., at 54-60 Second avenue, Brooklyn, was badly damaged by a fire believed to have started from spontaneous combustion, and which burned a large stock of old paper and rags. On November 22 the plant of the Chambers Paper Stock Company at 6 Wooster street, New York, was greatly damaged by a fire which started of undetermined origin on the second floor and spread rapidly to the third floor and roof. It took firemen an hour and a half to put the flames under control. The loss to the Chambers company was estimated at $75,000.

The White Paper Company, jobbers and mill agents, has moved from 653 Williams avenue, Brooklyn, to 35 Crosby street, New York, where it has larger quarters in a very centrally located section of the city.

The Diaphne Paper Company, of New York, was incorporated at Albany, N. Y., on November 21 to deal in paper with a capital stock of 550 preferred shares of stock of $100 value each, and 1,000 common shares of no par value. The incorporators were M. P. O'Leary, F. Frank and K. C. Cunningham.

Nathan Leshner, of the Leshner Paper Stock Company, Inc., with main office in Cincinnati and branches in other cities, sailed November 14 on the steamer Olympic for a few weeks' business trip to Europe.

Louis Birkenstein, head of the firm of S. Birkenstein & Sons, Inc., of New York and Chicago, dealers in and importers of papermakers' supplies, returned from Europe on the steamer Mauretania, landing at New York November 7, accompanied by Mrs. Birkenstein.

Ralph Bretzner, vice president of the American Baltic Corporation, wood pulp importers of 10 East Forty-third street, New York, returned from Europe a few days ago after having been abroad more than two months.

Norman Duxbury, director, and W. H. Ward, chief engineer, of Yates Duxbury & Sons, Ltd., Heapbridge paper mills at Bury, England, arrived in New York a few days ago for a visit in the United States during which they will call on a number of paper mills to observe manufacturing methods, etc.

George J. Jacob, of the firm of Alexander Jacob & Co., of London, among the largest exporters of paper stock from England to the United States, reached New York on the steamer Mauretania around the middle of November to visit some of his paper mill customers in this country. He spent a week in New York prior to leaving for the Middle West.

John H. Engelke, well known in the papermakers' supply trade in this city, is now associated with William E. Steck & Co., of 15 Park Row, New York, in charge of that concern's foreign rag department.

John Aspegren

John Aspegren, president of the Scandinavian Pulp Agency, Inc., wood pulp importers of 342 Madison avenue, New York, died on November 8 in Roosevelt Hospital, New York, following an operation for appendicitis about ten days previously. Mr. Aspegren, who was 49 years old, was one of the youngest

READING

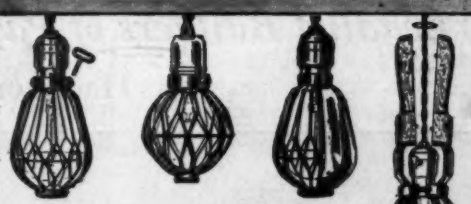
EXTRA HEAVY

CAST STEEL GATE VALVE

Clean, sound castings, design features calculated to compensate for line stresses, correct assembly principles, and ease of operation contribute to the satisfactory service of Reading cast steel valves.

READING STEEL CASTING CO.
INCORPORATED
Reading Valve and Fittings Division
An Associate Company of the American Chain Company, Inc.
929 Connecticut Ave., Bridgeport, Conn.

FLEXCO-LOK



Have You Any Lamps Exposed?

Here's better protection for your lamps at less cost than one new bulb—greater safety, better appearance and proper distribution of light. Guards are reenforced expanded metal, heavy tin finish, hinged in base. FLEXCO-LOK is key locking and prevents unauthorized removal as well as accidental breakage. FLEXCO Guards close with slotted round head screws. One large plant saved 60% lamp replacements in a year.

Sample and prices on letterhead request.
Sold by leading dealers.

FLEXIBLE STEEL LACING COMPANY
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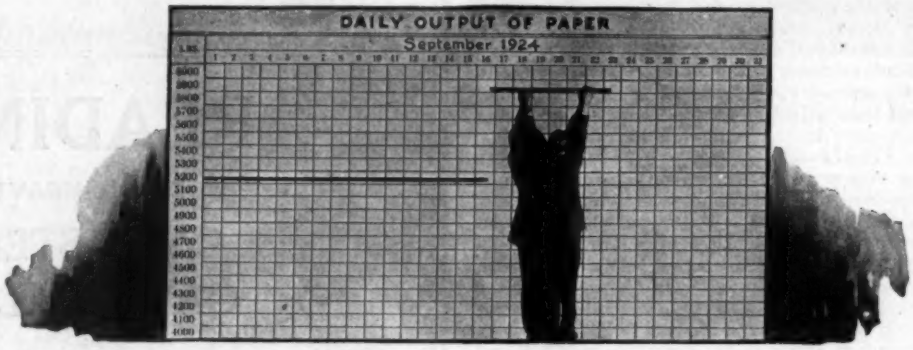
FLEXCO



Push the line upwards!

Profits in paper making depend as much upon production costs as upon the selling price.

You cannot, at will, increase profits by increasing the selling price, but you can increase profits by every reduction in production costs.

Every extra ton of paper made with your present equipment, labor, and overhead, increases your percentage of profit.

Tyler Fourdrinier Wires help push up the production line and to lower production costs. The firm, rigid weave, the smooth, uniform surface; the accurate mesh; the special, durable wire used in weaving—all combine to assure continuous and more profitable production.

Tyler "Quality" Fourdrinier Wires increase the productive hours of the Fourdrinier Machine.

THE W. S. TYLER COMPANY, *Cleveland, Ohio*

TYLER FOURDRINIER WIRES

CYLINDER WIRES BACKING WIRES WASHER WIRES CORDUROY WIRE CLOTH HUMMER ELECTRIC SCREENS

The BLACK-CLAWSON CO.

Leading Builders of Paper and Pulp Mill Machinery

Hamilton, Ohio, U. S. A.

Fan Pumps of Iron or Bronze in Sizes from 2" to 12".

ESTABLISHED 1873, and since we have steadily grown and stood forth as leaders in the manufacture of paper making machines and other equipment for every requirement in Board, Pulp and Paper Mills.

Our large plant and special equipment with skilled and trained help enable us to render efficient and prompt service and satisfaction to a customer.

The best is none too good.
Let us serve you.

and most successful merchants of the country, and for 25 years had been an important figure in New York business circles.

Besides being president of the pulp importing company, he was at the head of many other business ventures and was a member of the Board of Directors of the New York Produce Exchange, and a member of the Riding, Ardsley and New York Athletic Clubs. He was born in Malmo, Sweden, and in 1906 married Miss Bacon, daughter of Daniel Bacon, banker, and granddaughter of A. Ashley Vantine, importer, who survives him.

Thomas J. O'Neil, president of the Bank of Nutley and treasurer of the safety paper firm of George La Monte & Son, of 61 Broadway, New York, died at his home in Nutley, N. J., on November 4 of heart disease after a two years' illness.

J. W. Dolson, secretary and treasurer of the Standard Products Corporation, paper importers and merchants of 152 West Twenty-second street, New York, and also secretary of the Ancram Paper Mills, died on November 7 after a brief illness.

Announcement has been made that after January 1, 1925, the Solvay Process Co. will handle all sales of Crown Filler through the main office of the company, located at 40 Rector Street, New York City. Deliveries are made in carload lots from the Detroit, Mich., plant of the Solvay Process Co. Mr. J. H. Kaiser is the special representative of the Solvay Process Co. for promoting and handling the sales of Crown Filler to the paper trade.

New England News

December 1, 1924.

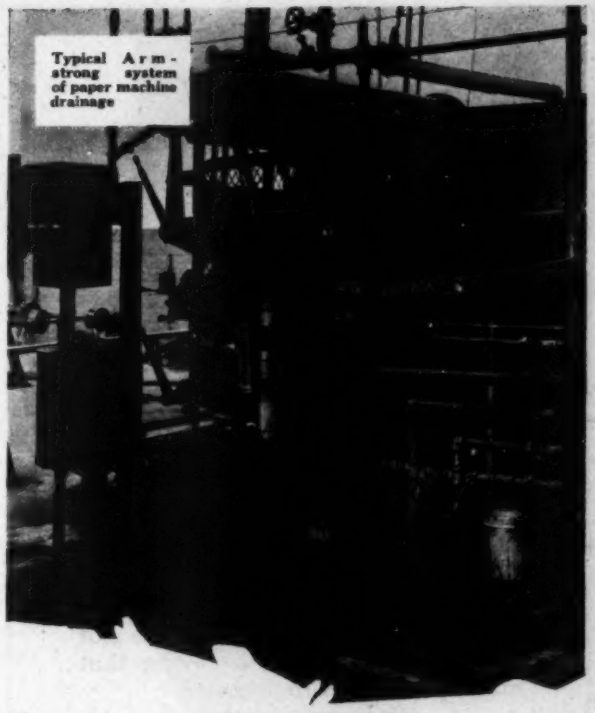
New Developments for Coming Year

One of the highest officials of the American Writing Paper Co. intimated some few weeks ago that important developments in the company's affairs would be forthcoming on or before the first of December. From local sources close to the banking interests involved, however, it is learned that matters are proceeding smoothly towards a complete reorganization, that there will be no distribution of assets, as might have been inferred from the recent foreclosure proceedings of the first mortgage bondholders. In fact, it is reported that the bondholders' protective committee appreciates the value of keeping the company property intact, barring such elimination of outlying mills or obsolete property as would interfere with greater-concentration and efficiency of operation.

Thus, the year will end in New England with this single cloud likely to be dispelled as 1925 commences, and the new year will also be ushered in with four construction programs of major importance: viz., a new mill to replace an old fashioned one for the Nashua River Paper Co., at Pepperell, Mass., with the possible addition of some beaters; a new mill, backed by capital at present not definitely known, at Madawaska, Me., to produce 200 tons of paper daily, possibly a sulphite bond, made from pulp produced in the Frasier Companies, Ltd., mill in Edmundston, across the river, according to the best available information; a new $600,000 mill for the Bird & Son Co., plants at Norwood, Mass.; while the most recent information of new construction pertain to a new plant for the Advance Bag & Paper Co.

J. N. Harvey, vice-president and treasurer of the Advance Bag & Paper Co., states that while a new plant is already under way at Howland, Me., for the Advance, full details regarding the matter will be withheld for the present until the plant reaches a state nearer completion. It is true that the new plant will be of importance to the mill and will be used partly for storage and partly for manufacture.

Mr. F. L. Moore recently purchased the controlling interest of the Westfield River Paper Co., Inc., Russell, Mass., and is its president and general manager. Mr. Moore will be remembered as a former president of the Newton Falls Paper


Typical Armstrong system of paper machine drainage

Less steam per pound of paper

Where the paper machine drainage system is right

TWO things are vital in the operation of paper machines—(1) the steam trap; (2) the way it is installed.

The Armstrong Trap has been extensively proved out under the most severe conditions that are ever encountered in paper mill service—and it is backed by an organization that is peculiarly qualified to recommend the system of drainage that will prove most effective and economical.

Ask for a special circular showing a system of paper machine drainage that means less steam—less coal—per pound of paper produced.

What the Armstrong system insures—

Easy and positive control of dryer pressures and temperatures to suit stock.

Ability to carry low temperatures in one or more wet end dryers as desired, with acknowledged advantages.

Ability to automatically maintain vacuum in dry headers.

Maintenance of low steam pressures.

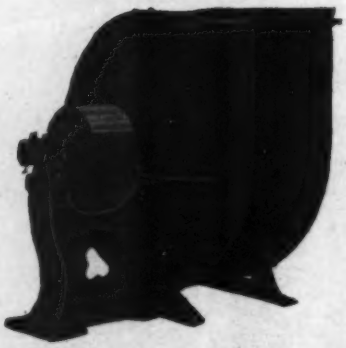
Economical steam consumption; no steam to be killed with cold water.

The Armstrong Machine Works
322 Steam Saving St.
Three Rivers, Michigan

The Standard Armstrong Trap is furnished for pressures from 0 to 300 lbs.—for service on vacuum where inlet pressure is greater than outlet pressure—for draining water from compressed air expansion tanks, separators, etc.—for service on grease. The Armstrong Special is furnished for pulsating pressures.

Armstrong Steam Trap

VI 12-M-RTG



Exhaust Fan ECONOMY

Economy in exhaust fans is not measured entirely by a saving that may be made in first cost.

Over a long period in operation the savings that are effected in power costs will save the amount of the investment several times over.

And then — the continuous, dependable operation that is in-built in every Bayley Exhaust Fan must be considered as economy, for it insures against interrupted operation and suspended processes.

For removing dust from rag room, material from chippers, barkers and grinders, Bayley Exhaust Fans will exactly fit every need.

They are sturdily constructed throughout. The blast wheel is of particularly strong design and will easily withstand the shock of oversize material and large chunks of wood.

Investigate Bayley construction before you purchase exhaust equipment.

Bayley

MANUFACTURING CO.
748 Greenbush Street
MILWAUKEE, U. S. A.

18

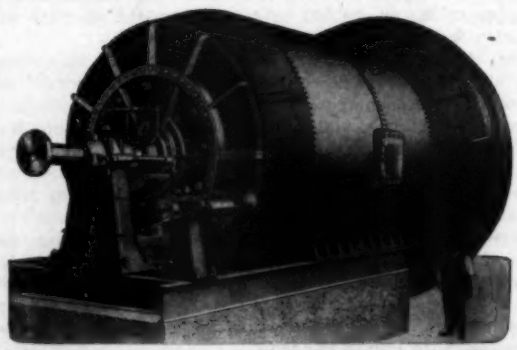
A cross section showing the "Crescent" vise-like grip on the lengthwise fibres. A "Crescent" joining outlasts the belt.

Grip

Crescent Belt Fasteners grip the belt fibres—become part of the belt itself. No weakening holes. Nothing touches the pulleys. No wear nor noise. Write for Booklet on Modern Belt Joining, Crescent Belt Fastener Co., 247 Park Avenue, New York.

CRESCENT
BELT FASTENERS

LEFFEL
TURBINE WATER WHEELS



HIGH SPEEDS, HIGH POWERS, HIGH EFFICIENCIES

All of our turbines are designed and built to suit location and requirements, by engineers and experts who have had years of experience in this particular line of work. Turbines fully guaranteed.

Bulletins Forwarded Upon Request

The JAMES LEFFEL & CO., Springfield, Ohio

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LANCASTER, PA. ..... Woolworth Building
PETERBOROUGH, ONT., CANADA .... William Hamilton Co., Ltd.

Co. Mr. Karl Becker remains with the Westfield River Paper Co. as vice-president and sales manager.

To Regulate Kennebec

Two of New England's most important paper companies, Great Northern Paper Co. and Hollingsworth & Whitney Co., have, with support from power companies and other industries, conspired together for the past several years to regulate the flow of the Kennebec River, so as to avert the floods periodically devastating the river banks and abutting property, and to increase the supply of water during periods of drought. Thwarted in this highly praiseworthy and needed effort by politicians at Augusta, the companies have for the present abandoned their Dead river project which would have damned the west branch of the Kennebec, while at the same time producing immense waterpower.

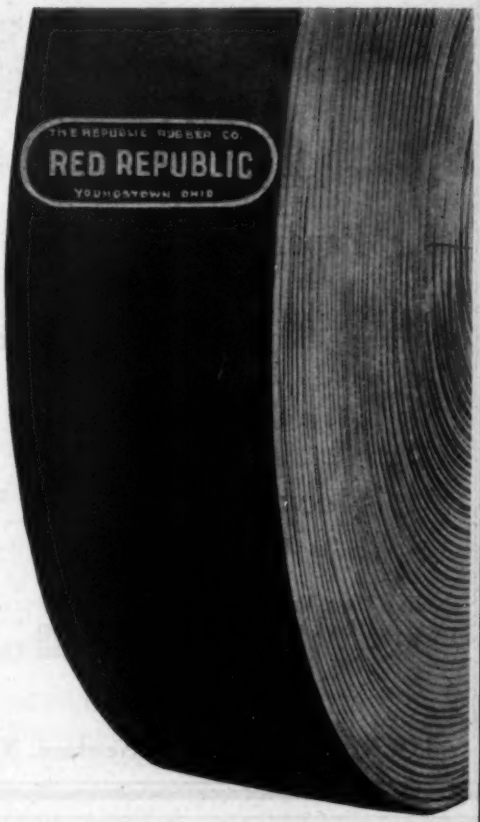
The new project on the Moose river, the Kennebec's east branch will contribute materially towards proper regulation of flowage, but will involve no power production. The site of the dam is to be at Rockwood and work has already commenced, for it is hoped to have it completed next fall. The dam will be of concrete masonry, will raise the level of Brassua lake 30 feet and will impound eight billion cubic feet of water. The Eyre-Johnston Co., construction engineers, have received the contract. They have a big power plant and dam at Rumford already to their credit. The dam will be 1,800 feet long, with a spillway of 300 feet.

Boston Trade Meets

The Boston Paper Trade Association held their annual fall meeting on Wednesday evening, November 19, at the Exchange Club, Boston. An unusually excellent speaking program was on schedule, and it fully came up to expectations. The usual excellent menu of the Exchange Club provided a fine dinner which was enlivened by a jazzy but melodious orchestra. Gerrit Fort, vice president of the Boston & Maine R. R., and a well known speaker on railroad and transportation topics, made the opening address. He discussed the New England paper industry and its relation to the railroads in general and the B. & M. in particular. Out of a total of some 70 general classes of commodities handled, paper stands fourth on the B. & M. in point of value to the railroad. Mr. Fort discussed briefly the present class rate investigation at Washington, which he declared would probably mean a slight reduction in sixth class (which includes paper) rates to Central Freight Association territory. In general, he felt that the paper trade, selling the big middle western markets, particularly Chicago and St. Louis, would be benefited by the new rates. He next plunged into a warm discussion of motor truck competition which has displaced B. & M. freight service between Boston and such important paper producing points as Haverhill, Lawrence and Fitchburg, but which might be regained by the railroads through their own truck lines, operating under the newly chartered Boston & Maine Transportation Co., organized in Massachusetts to operate motor truck freight lines.

Mr. Fort was followed by Ralph P. Robinson, chief assistant of Capt. Donald B. MacMillan, on the latter's famous Baffin Land and North Greenland expeditions. Mr. Robinson brought with him several score of vivid photographs taken on both expeditions which were shown through the medium of a stereopticon. The talk accompanying the pictures was filled with fascinating stories of the experiences of various members of the expedition and gave the hearers many thrills. It was a powerful chronicle of a wonderful voyage, and as New Englanders, we are proud of this hardy group of scientists who will brave the arctic for months and a year on end to further scientific knowledge.

The meeting was voted a highly successful one by the 90 members and guests who attended. Incidentally three new members, Karl H. Ways, Boston manager for Groveton and Claremont Paper Cos.; George M. Graves, paper mill supply dealer, and Howard L. Blake, president of the Fort Hill Paper Co., were accepted into membership. President McQuillen of



Slippage Wastes Power —Cut It Out!

A belt that stretches is a belt that slips. Every time a belt slips power is wasted. These wastes pile up and soon result in higher production costs.

Red Republic Belting is immune to slippage because it does not stretch. Specially treated to resist moisture, it retains its initial strength and delivers every ounce of power with unceasing sureness.

If hidden power wastes have been increasing your production costs, we suggest that you consult our distributors about your belting problems.

THE REPUBLIC RUBBER COMPANY
Youngstown, Ohio

REPUBLIC BELTING

LOCKPORT Felts

EXCLUSIVE MAKERS OF

Paper Makers' Felts

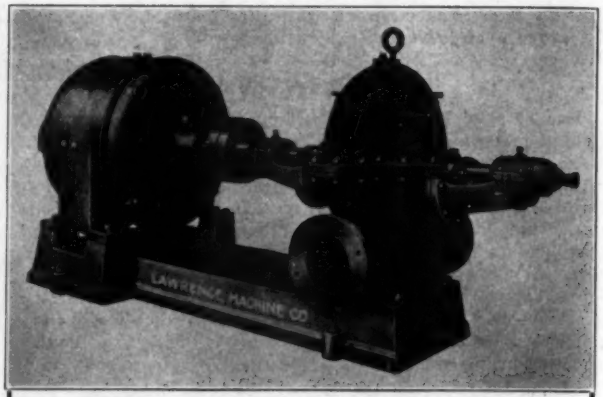
Have You Run Them?
If Not, Why Not?

Are You Interested in Accurate Running Felts?

Give Us a Trial
Get Authentic Information
Ask the Men Who Run Them

Yours for service

LOCKPORT FELT CO., Newfane, N. Y.



LAWRENCE Centrifugal turbine pump, single stage, horizontally split casing, double suction enclosed impeller, high pressure pumps for water supply service, designed and built in all sizes to meet all conditions. Direct connected to electric motors, steam turbines, gasoline engines, etc. Material and workmanship of the highest class. Please submit to our engineering department your specifications. Prompt service rendered at all times.

LAWRENCE MACHINE COMPANY
LAWRENCE, MASS.
Manufacturer of "Lawrence" Pump, Centrifugal Pumping Machinery, Vertical Steam Engines, Contractors for Special Machinery

MANITOWOC ENGINEERING WORKS
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Designers and Builders of

Digesters
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Bleach Mixers
Clay Mixers

Dayton Globe Iron Works
DAYTON, O.

We manufacture Beating and Washing Engines, Head Gates, Hoists and Gears.

Our Wedge Type Bandless Roll made of semi-steel with special alloy bars is practically indestructible.

the National P. T. A., was appointed by President Stevenson of the local organization to constitute himself a nominating committee for the spring meeting.

United Against Rate Increases

Holyoke Paper Mills, represented by the Holyoke Traffic Bureau, P. J. Dowd, manager, will oppose to the limit the proposed increased rates from New England to such important trunk line cities as Baltimore, Philadelphia, Washington, etc. New England paper makers have been assured by railroad officials that the Class Rate investigation involving New England and Trunk line to C. F. A. district rates would probably result in slight declines for sixth class including paper.

However, the railroads will now propose at the hearings, beginning next February 4th, a realignment of the eastern rate structure with drastic advances on the cards. With Holyoke strongly opposed and with the New England Paper & Pulp Traffic Association representing eastern Massachusetts and northern New England mills, also standing firmly against an increase which would mean advances, for example, of 7 to 8c in the Rumford and Claremont rates to Baltimore and Philadelphia, the trade presents a united front.

John A. Andrew, recent president of Stone & Andrew, Inc., of Boston, and a past president of the Boston Paper Trade Association, has become affiliated with the sales department of the New Jersey Coated Paper Co. of Montclair, N. J.

Tileston & Hollingsworth Co. now expect to be operating their new paper mill equipment at Mattapan, Boston, before the end of January. They are constructing a four-story rag, clay storage and beater room. New beaters will be installed and a new paper machine will be ready soon. It is under construction in the shops of Rice Barton & Fales Co. at Worcester. It will be entirely a new machine except for some dryers taken from the Fourdrinier which it replaced.

The Amoskeag Paper Mill of Manchester, N. H., has petitioned for a receiver in the Boston Federal Equity Court to be appointed for the Pepperell Card & Paper Co. of Pepperell, Mass. The Amoskeag Paper Mill contends that large sums of money have been withdrawn from the Pepperell company and the business consequently impaired. Nevertheless, the plaintiff declares that the present liabilities will not total more than $200,000, while there are definite assets, not all liquid but still sound, aggregating some $450,000. To forestall any serious consequences the appointment of a receiver was deemed highly desirable by the court.

Portland, Me., is growing rapidly as a spot market and port of entry for Scandinavian pulp. Traffic Manager Feener of the Maine State Pier at Portland reports that the early winter arrivals of chemical woodpulp from Scandinavian ports have exceeded anything since the pier was constructed. One of the heaviest importers through Portland is M. Gottesman & Co. Reasonable storage rates and a liberal free time allowance, together with proximity to New England markets, and a direct Canadian railroad which connects with Kalamazoo and Fox River Valley districts, make Portland a logical focal point for the import pulp trade.

By order of the Interstate Commerce Commission, the Canadian National Railways are forced to suspend their proposed increase of 3c per hundred pounds on pulpwood and other forest products from the Maritime Provinces and Quebec to New England railroad points. The suspension holds until next March, during which time the matter will be thoroughly thrashed out.

Ten pulpwood barges of the Pejepscot Pulp & Paper Co., at anchor near Belfast, Maine, were badly damaged, two of them being destroyed by a fierce gale which swept the Atlantic seaboard, on November 23. Fortunately, the company had largely completed its movement of pulpwood from the prov-

GURNEY
BALL BEARINGS

for
Greater Capacity

COMPARE Gurney Ball Bearings—Maximum Service—Maximum Capacity type—with like sizes of other bearings. Note the greater number of maximum size balls per bearing. The race curvature is such that they have increased areas of contact.

These are the secrets of their ability to safely carry greater loads than other bearings of equal size. This is done without affecting the life of the bearing or its efficiency.

Gurney load capacity ratings are considerably higher than are the ratings for bearings of other types—and you will find Gurneys performing unfailingly in any number of machines where this additional capacity is essential to the successful performance of the machines.

GURNEY
BALL BEARINGS

1827-4

Marlin-Rockwell Corp.
successor to
GURNEY BALL BEARING CO.
JAMESTOWN, N. Y.

DUXBAK

LEATHER BELTING

efficient durable economical

an ideal belting for paper mill drives

—our series of "Quality Facts about Belting" tells you why
Write for them

DUXBAK BELTING TRADE MARK

Thoroughly Waterproofed and Built for Service

Chas. A. Schieren Company

Tanners
Belt Manufacturers

73 FERRY STREET, NEW YORK

Branches and Distributors in All Leading Cities

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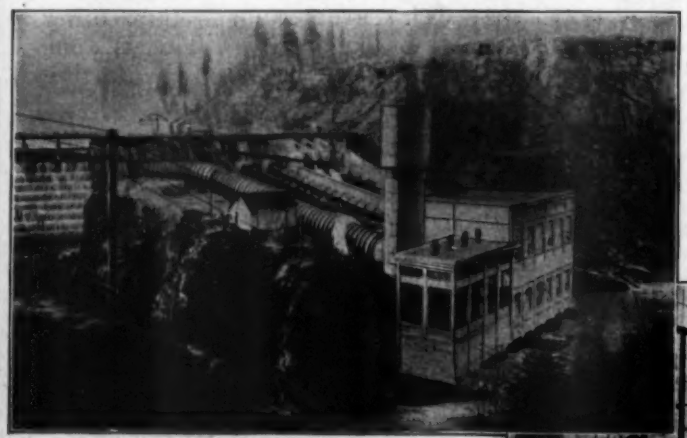
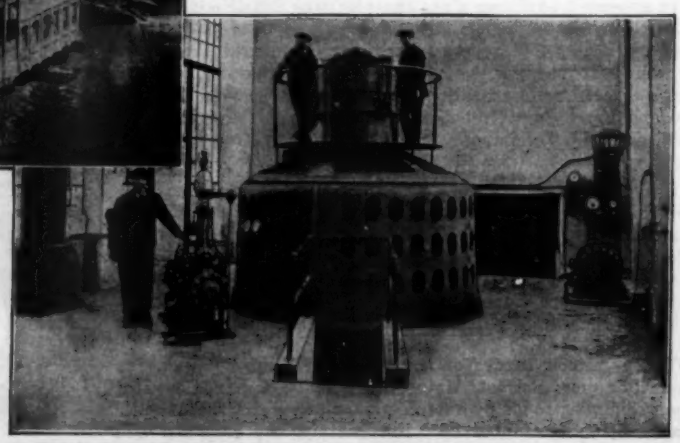
The Texas Chas. A. Schieren Co., Dallas, Tex.

Send for catalogue

SMITH HYDRAULIC TURBINES



developing 10,000 H. P. under 100 ft. head are in successful operation in the new power plant of The Washington Pulp and Paper Co., at Port Angeles, Washington. Interior and exterior views of this plant are shown herewith. Turbines are of Vertical shaft scroll case type driving direct connected generators.



S. Morgan Smith Company

YORK, PA.

Branch Offices:

CHICAGO 76 W. Monroe St. BOSTON 176 Federal St. MONTREAL 405 Power Bldg.

inces, and its tugboat "Pejepscot" has been at Portland undergoing repairs.

A storage warehouse of the Great Northern Paper Co. at Stockton Springs, Me., used by the company as a depot for newsprint and bag paper prior to shipment by water or rail, was destroyed by fire on November 8. Fortunately, there was not a large amount of paper on hand at the time. The fire started in and destroyed large wharves of the Bangor & Aroostook R. R.

An exhibit of the fine papers made by the Worthy Paper Co. was shown at the New England District Convention of the Associated Advertising Clubs of the World, at Hartford, Conn., on November 17 to 19. Arthur E. Ham & Son, Boston merchants, were in charge.

Examiners for the Maine Public Utilities Commission and the I. C. C. have heard the petition of the Quebec Extension Railway for a 112-mile electric railroad through the heart of spruce and fir timberlands in Aroostook county. Paper and pulp companies are to be invited to establish branches along the line.

It is reported that New York and Massachusetts paper manufacturers are contemplating putting up a large plant on the Mispee River, Bay of Fundy.

Foreign Correspondence

Paper Facts for the British Public

Following on the successful exhibition of the miniature papermaking plant at the British Empire Exhibition this summer, when hundreds of thousands of the British public were enabled to see for the first time the complete process of paper production, it is particularly significant that the "London's Underground" group of companies should introduce into their educative advertising campaign a double-column advertisement containing a brief story of how the paper, which is used in the production of their many and varied types of tickets, is made.

The "Underground" group have shown themselves to be firm believers in the value of educative publicity from the point of view of increasing public confidence and popularity.

The story reads as follows:

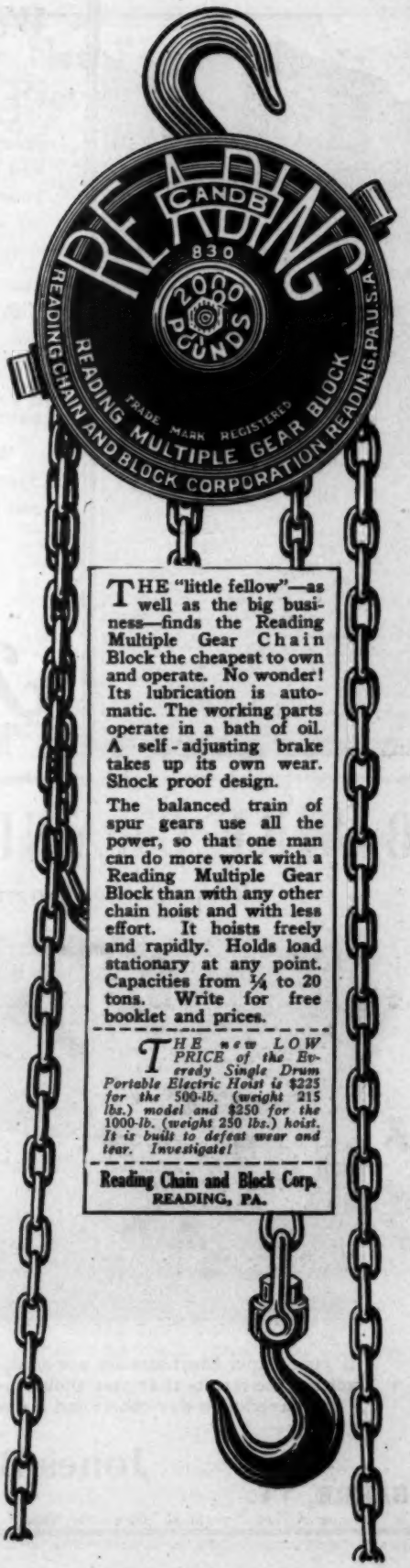
A Talk on "Paper"

Paper is manufactured from spruce, pine, esparto grass, etc. The raw material is converted into pulp and it required 1,100 tons of this pulp to meet the annual requirements of London's Underground. Your railway ticket, your bus and tramway ticket in all probability originated in the backwoods of Newfoundland, Canada or North Africa.

Last year the railways issued 201,448,000 tickets weighing 206 tons, the omnibuses 1,134,000,000 tickets weighing 504 tons and the tramways 190,000,000 tickets amounting to 83 tons, a total of 793 tons.

Four and a half million tickets have to be issued daily. All these tickets must be numbered and priced. A ticket is a record of a passage across London. The printing of the tickets, their distribution and checking finds employment for 12,000 people. Besides tickets, London's Underground used 320 tons of paper for maps, posters and stationery. The Underground is therefore a considerable supporter of the paper industry. It is necessary details of this description that add to the cost of carrying the passenger—the passenger is apt to overlook this when paying his penny or twopence for his ride.

The Underfeed Stoker Company, Ltd., of Great Britain, an associated company of the International Combustion Engineering Corporation, has recently received an order for six chain grate stokers of the self-contained type from one of the largest paper mills in Holland. These are similar to the

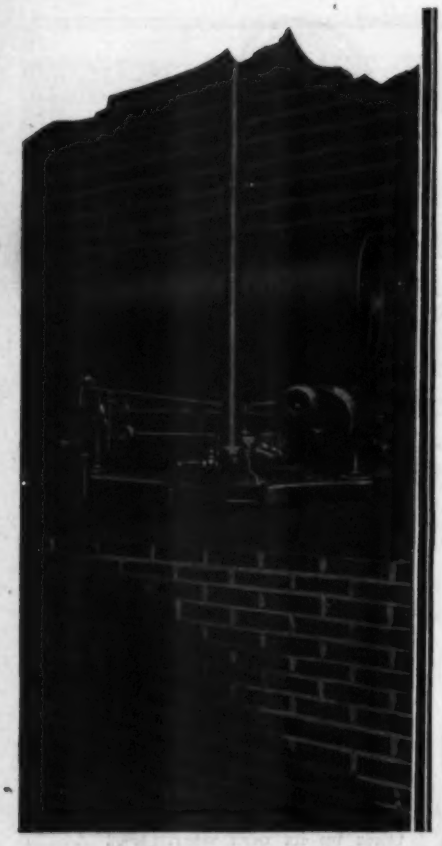


THE "little fellow"—as well as the big business—finds the Reading Multiple Gear Chain Block the cheapest to own and operate. No wonder! Its lubrication is automatic. The working parts operate in a bath of oil. A self-adjusting brake takes up its own wear. Shock proof design.

The balanced train of spur gears use all the power, so that one man can do more work with a Reading Multiple Gear Block than with any other chain hoist and with less effort. It hoists freely and rapidly. Holds load stationary at any point. Capacities from ¼ to 20 tons. Write for free booklet and prices.

THE new LOW PRICE of the Everready Single Drum Portable Electric Hoist is $225 for the 500-lb. (weight 215 lbs.) model and $250 for the 1000-lb. (weight 250 lbs.) hoist. It is built to defeat wear and tear. Investigate!

Reading Chain and Block Corp.
READING, PA.



Would You Leave Water in Your Carburetor?

Condensation in your steam lines is like water in your carburetor. It reduces efficiency—wastes fuel and causes poor performance. If you had water in your carburetor you would waste no time in draining it out.

Why not drain the water from your paper machines, dryers, evaporators and mill heating system with a Morehead Back-to-Boiler System? It will not only keep your steam lines clear and dry, thus enabling every pound of coal to do its maximum work, but also the condensation will be returned to your boilers at high temperature.

Write and learn how Morehead Back-to-Boiler Systems are effecting big savings in plants throughout the country.

Morehead Manufacturing Co.
Dept. O, Grand River at Warren
Detroit, Mich.

Adv. No. 127

Morehead
"BACK-TO-BOILER-SYSTEM"
POSITIVELY DRAINS ALL TYPES OF STEAM APPARATUS. DELIVERS CONDENSATION AND FEED WATER TO BOILERS UNDER ALL CONDITIONS AT MAXIMUM TEMPERATURE.

BARRE GRANITE IN PRESS ROLLS

Is Revolutionizing the Whole Paper Making Industry

If your Paper Machines are not equipped with Press Rolls of BARRE GRANITE you are not getting the results that you should get, for it is a recognized fact that granite rolls are much superior to any others and Barre Granite the best of all. Let us tell you about them.

Jones Brothers Company

BARRE, VT. **BOSTON, MASS.**

stokers recently ordered by the Montreal Tramways from the Combustion Engineering Corp., Ltd., of Canada, a subsidiary of International, and are being introduced in the U. S. by the Combustion Engineering Corp. of America.

Finland Free from Termites

Following is copy of a report recently received by the American Paper and Pulp Association from the Consulate General of Finland, regarding the matter of damage to Finnish news by white ants or termites:

"Having been requested to give a statement concerning certain correspondents regarding termites found in paper shipped to the United States, I have the honor to submit the following after having familiarized myself with the accompanying documents:

"From the article contained in the 'Paper Trade Journal' concerning harmful insects ('white ants') found in and having damaged a bale of paper received from Finland by Bulkely, Dutton & Co., it does not definitely appear what insect has caused the damage, even though the description would indicate that some kind of a termite is here in question. From the letter of the 'American Paper and Pulp Association,' dated September 23, 1924, it becomes clear, however, that samples of the paper in question have been sent to the 'Federal Bureau of Entomology' and that both have ascertained that the damage was done by a termite or so-called 'white ants.' Hence we can consider it certain that the damage was caused by a termite and not by an ant proper.

"As regards Finland, I can certify that termites are not found here, and to my knowledge no kind of termites have ever been found here, which otherwise here in Europe are only found in more southerly and warmer regions. Not once has the entomological department of the Agricultural Experiment Station nor the agricultural and forest zoology institute of the university nor the Entomological Museum received any information of any discovery of termites in Finland, still less of damage caused by them, nor have I heard of them otherwise. For this reason I consider it certain that no termites could have been in the bale when shipped from Finland, but that they have entered it en route or at destination.

"At the same time I beg to state that to my knowledge there are no other ants proper which here in Finland make their nests in paper or paper pulp or which would cause it damage.

"At Helsingfors, October 27, 1924.

UUNIO SAALAS,

Acting Associate Professor of Agricultural and Forestry Zoology."

"Home" Production of Paper

It is interesting to note that among the activities of the Rural Industries Bureau, which was founded a few years ago with the object of reviving some of the old decaying industries of the countryside, and thus serving the double purpose of giving the cottager a subsidiary occupation and making him better contented to remain a countryman, is a movement to encourage the farmer who has stocks of surplus straw on his hands to purchase the plant for the manufacture of straw ropes and straw envelopes, which would find employment for his laborers and their families.

Such organizations as the Women's Institutes movements and the Peasant Art Guild are doing a great deal of good in teaching rural housewives pleasant and profitable spare-time occupations and in finding markets for their home-made products.

It has been pointed out by Lord Ernle, late Minister of Agriculture and Fisheries, recently, that in Germany and France these spare-time occupations in country districts are very much encouraged, and that, owing to the popularity of the subsidiary remunerative employment in the rural industry, the wage-earning agricultural workers are not troubled by winter slackness on the farm, nor is the industry hampered by the overhead charge of paying wages at a season when they cannot be earned.

New Savings—Preventable Loss

First: Group drive for your paper machine slices off electrical maintenance cost and power bills. Repairs are few and the power factor is high in *group drives.*

Second: Shut-downs caused by belt trouble are largely preventable. One man in charge of belting in a mill will save his salary twice over by *correcting* bad conditions before a break-down comes. Try it, and steer away from unnecessary losses. *Waterproof leather belts* transmit more power than any substitute (rubber has an extremely low frictional value when wet). Leather belts also have a longer life and higher salvage value than substitutes.

Read this:

Robert W. Drake, electrical engineer of the McCormick International Harvester Plant has written a pamphlet on "When to Use Group and Individual Drives". He knows drives and belts—he has used nearly every kind of tool—*his pamphlet is practical.*

Tests which it has taken years to work out are at your finger-tips for the asking.

Use this coupon today—it has put money in other pockets—get yours. Nothing takes the place of LEATHER

LEATHER BELTING EXCHANGE
Philadelphia, Pa.

Nothing takes the place of
LEATHER

Address LEATHER BELTING EXCHANGE 8
417 Forrest Building, Philadelphia, Pa.

Please send me a free copy of "When to Use Group and Individual Drives" by Robert W. Drake.

Name .....

Name of Firm .....

Address .....

City ..... *State* .....

Position Held .....

Fitchburg Duck Mills

ESTABLISHED 1844

FITCHBURG, MASS.

MANUFACTURERS OF

STANDARD AND MULTIPLE PLY

DRYER FELTS

English Weave in Two, Three, Four, Five and Six Ply—60 Inches to 176 Inches in Width

Fine Faced Felts for Fine Papers. Absolutely no felt marks in paper. TRIUNE Three Ply Felts for Coarse Papers.

Paper and Pulp Knife Grinders

using

Sectional Wheel, Cup Wheel or Straight Wheel

Catalog on Request

BRIDGEPORT SAFETY EMERY WHEEL COMPANY

102 Knowlton Street, Bridgeport, Conn.

HAMLER BOILER AND TANK CO.

FABRICATORS OF STEEL PLATE FOR OVER SIXTY YEARS

SEND DRAWINGS AND SPECIFICATIONS FOR PRICES

CHICAGO-MINNEAPOLIS-ST. LOUIS-NEW YORK

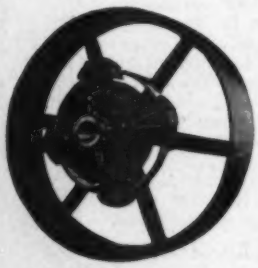
A complete line of

Power Transmission Machinery

FOR

BELT AND ROPE DRIVES

MANUFACTURED BY



FALLS SOLID FRICTION CLUTCH PULLEY

THE FALLS CLUTCH & MACHINERY COMPANY

NEW YORK 286-288 Fulton Street

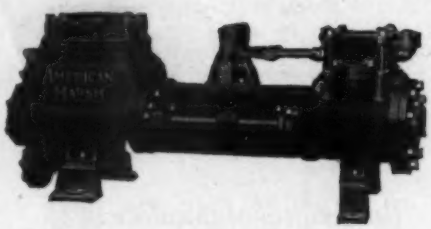
Cuyahoga Falls, Ohio

BOSTON 52 Purchase Street

Catalogues upon request

AMERICAN-MARSH PUMPS

SIMPLEX—DUPLEX—CENTRIFUGAL

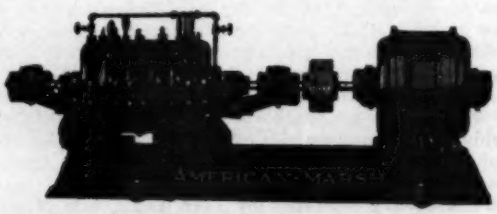


ALL American-Marsh Pumps, whatever the type, are heavily constructed with the best of material and workmanship. They are the result of over 35 years' experience in the building of high grade pumping machinery. Every pump is given a thorough test under actual working conditions before shipment.

There are over 165,000 in successful operation.

The line includes:

Boiler Feed Pumps
Suction Box Pumps
Wet and Dry Vacuum Pumps
Air Compressors
Bilge Pumps
Condensation Pumps
Centrifugal Pumps
Paper Stock Pumps



Write for bulletin covering type in which you are interested

AMERICAN STEAM PUMP COMPANY

BATTLE CREEK, MICH.

Penetration Is Chief Characteristic of Gardco

Corrosion is the largest destructive factor known—even greater than fire. Statistics show that sixty-five million tons of iron were produced in the year of 1923, and approximately thirty-four million tons were destroyed by corrosion. The paper industry contributed a generous portion because of the unusual conditions that exist in the mills. Past experience has already taught the maintenance engineer that the ordinary paints are not suitable for the problems that he is confronted with.

In order to successfully arrest corrosion, it is necessary to get behind the rust barrier that forms so readily on metal which is subject to oxidation. This requires an anti-corrosive solution or coating that has extreme penetration qualities. The Gardco Paint Products Company, Chicago, have compounded an anti-corrosive solution by fluxing together in sequence numerous hydro carbons. Applied cold, the same as any paint, it dries into a tough, elastic film within a short period of time—approximately three to four hours, depending of course, on atmospheric conditions.

There is sufficient elasticity in Gardco for expanding and contracting at all temperatures, which makes it a rust-proof and rust-preventing solution of exceptional merit. It resists the action of practically all acid and alkali fumes. It will withstand approximately 750 degrees of heat Farenheit, and is unaffected by moisture, spray or condensation.

The success of this anti-corrosive solution is contributed entirely to the fact that it is a chemical mixture, which, of course, does not contain a pigment. As such, it requires no mechanical mixing, eliminating the possibility of the painter's application of preservatives in a partial suspended state. By chemical experiments, colors in red, gray, green, brown, buff and dark blue have been perfected without the use of pigments.

"Hill Clutch" Mill Equipment Widely Used

The manufacturers of the "Hill Clutch" Mill Equipment report 1924 as a very successful year with many installations in the Pulp and Paper industry, 20 of which were outstanding.

Where new plants were put in operation, either the power transmission equipment or the agitator equipment, or both, was supplied.

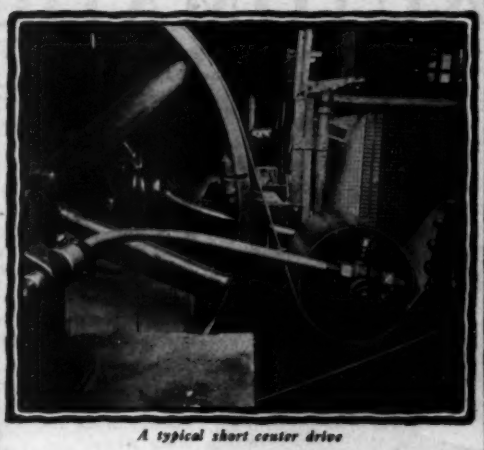
To the others the equipment furnished consisted of "Smith Type" Hill Friction Clutches, "Industrial Type" Spur Gear Speed Transformers, "Cleveland Type" Collar Oiling Bearings or general line shaft equipment.

The "Industrial Type" Spur Gear Speed Transformer has been on the market but two years. It was designed to meet the very urgent demand for speed changing devices in mill operation.

The Elliott Co. recently acquired a large controlling interest in the Kerr Turbine Co. and have therefore added Kerr Turbines to its already large line of power plant equipment. Kerr Turbines will continue to be manufactured at the Kerr plant, Wellsville, N. Y., under the direction of Elliot Co., and the efficient engineering and manufacturing organization at Wellsville will be retained. Mr. L. B. McCarthy has been appointed sales manager of Elliott Co.'s Turbine Department, with headquarters at the Kerr Works, Wellsville, N. Y. Mr. McCarthy will direct the activities of the regular sales organization of Elliott Co. in that department, reinforced by capable turbine specialists.

The Nordberg Manufacturing Company, Milwaukee, Wis., announce that Rudolf Wintzer, who heretofore had been the late Bruno V. Nordberg's engineering assistant for 15 years, and Bruno V. E. Nordberg, executive and assistant chief engineer, will continue in the conduct of the engineering department.

Foote Bros. Gear & Machine Co. have recently completed arrangements with Chas. Bond & Co., Philadelphia, Pa., for



A typical short center drive

Better belts for short center drives

PAPER mills have been quick to adopt the short center drive, because it saves valuable space and power.

The efficiency of a short center drive depends upon the belt. It must be super-strong to handle the load. Yet it must also be flexible and pulley-hugging to stand up under the constant bending of this type of drive.

You will find such belts in the Standardized Series—a grouping of brands of Graton & Knight Leather Belts to give the right belt for the right job—throughout the entire plant.

Graton & Knight Standardized Series Belts for paper mills are guaranteed water-proof. Regardless of wet working conditions, they give steady, economical transmission.

From the selection of the hides, through the tannery, to the finished belts they are made for the paper mill man. All in Graton & Knight's own plant.

Write to-day for book 101-S, which tells the interesting story of water-proof Standardized Leather Belting.

THE GRATON & KNIGHT MFG. CO.
Tanners—Makers of Belts and Other Leather Products
Worcester, Mass.

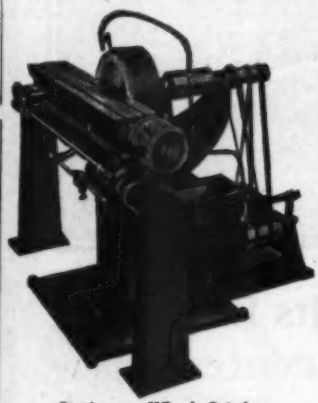
GRATON & KNIGHT
Standardized
LEATHER BELTING
Nothing takes the place of Leather

GRATON & KNIGHT

AUTOMATIC GRINDERS

200 Lbs. to Ten-Ton Weight

For Knives 26 inches to 19 ft. long



Stationary Wheel Grinder

STRAIGHT wheel, cup wheel, ring wheel, sectional block wheel, sandstone wheel, grinders.

Full automatic, semi-automatic and hand machines.

Stationary wheel and traveling work or stationary work and traveling wheel.

Belt or motor drive.

Open frame or fully enclosed, completely self-contained, cabinet base machines, for every variety of service.

Send for Catalog Covering New Type Machines

Machinery Company of America

Big Rapids, Mich. U. S. A.

MEISEL SHEET CUTTERS

Automatic Intermittent Feed Sheet Cutting and Slitting Machine

Cuts all kinds and thicknesses of paper from News to the thickest Box Board, various kinds of Cloths, Combined Cloth and Paper, Tinfoil, and other material taken from the web.

Sheets up to 132″ in length may be cut.

Ask for Photograph C-1001

Meisel Press Mfg. Co.

942 Dorchester Ave. Boston, Mass.

SIMONDS

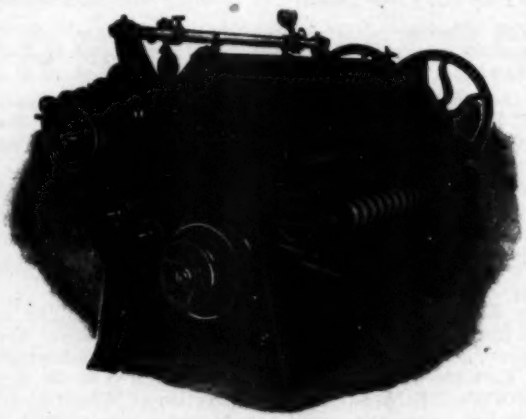
Barker and Chipper Knives

The best knives for Pulp Mills. Made of the finest edge-holding steel, skillfully made and tempered right to withstand wear.

Write for Catalog and Prices

Simonds Saw & Steel Co.

Fitchburg, Mass. Chicago, Ill.



PAPER CUTTERS

Single, Duplex, and Diagonal

CUTTER KNIVES
PATENT TOP SLITTERS

Hamblet Machine Co.

LAWRENCE, MASS.

the distribution of their IXL gear products and speed reducers in eastern Pennsylvania and Maryland, the state of Delaware and all of New Jersey south of Mercer county.

Civil Service Wants Valuation Engineer

The examination is for the Technical Staff of the Income Tax Unit of the Bureau of Internal Revenue, Treasury Department at an entrance salary of $3,800 a year. Advancement in pay may be made without change in assignment up to $5,000 a year.

A separate register of eligibles will be kept for each of the following lines: pulp and paper, oil and gas, hydraulic and hydroelectric, timber, coal, general mining and nonmetals mining.

Full information may be obtained from the U. S. Civil Service Commission, Washington, D. C., or from board of civil service examiners at the post office or custom house in any city.

New Booklets, Catalogs, Etc.

Report on Technical Education Issued

A short report from the National Industrial Conference Board upon the subject, "Technical Education and the Paper and Pulp Industry," has been issued. This report was prepared by the Conference Board after a very strenuous effort to get information from the paper industry, and it is believed that enough returns were received from paper and pulp manufacturers to justify the conclusion of the Conference Board.

The American Paper and Pulp Association, which is working very closely with the Conference Board, was asked at the beginning of this study to suggest a special advisory committee to work with the board in the preparation of this report. The following committee was appointed and has given a good deal of time to the study, holding several meetings in the office of the board: Henry W. Stokes, York Haven Paper Co.; Colonel B. A. Franklin, Strathmore Paper Co.; G. H. Mead, Mead Pulp & Paper Co.; J. P. Kimberly, Kimberly-Clark Co.; J. H. Stannard, Grand Lakes Co.; George H. Wadleigh, West Virginia Pulp and Paper Co.; W. G. MacNaughton, Technical Association of the Pulp and Paper Industry; Hugh P. Baker, American Pulp and Paper Association.

The purposes of the survey were to discover to what extent the paper and pulp industry uses technically trained men, what positions they hold, how the industry absorbs them and what further training it provides for them, and to determine the kind of technical training at colleges which will better qualify the graduates for responsible positions in the industry. From this information it is intended to draw deductions regarding what is necessary to insure a closer and more responsive relationship between technical education and industry. The American Paper and Pulp Association has extra copies of this report and should copies be desired, they will send as many as are needed.

An attractive eight-page folder in two colors has just been issued by the Brown Hoisting Machine Co., Cleveland, O., in which clam shell buckets in every stage of operation are described and illustrated throughout the eight pages. In all, 30 pictures and drawings show Brownhoist clamshell buckets working on different types of cranes raising coal, sand and other materials. Details are illustrated further by the use of cross-section drawings.

Two new catalogs have just been published by the W. A. Jones Foundry & Machine Co. of Chicago, Ill. Catalog No. 31, "Jones Power Transmission Machinery," which covers shaft hangers, pillow blocks, couplings, collars, belt tighteners, mule stands, bench legs, etc.; all items are well illustrated, listed, dimensioned, tabulated, etc. The very latest data on a completely rounded out line of quality transmission appliances; and Catalog No. 32, "Jones Sprocket Wheels and Chain Belting," covering a full line of sprocket wheels and chain belting, as well as chain tighteners, elevator boots, buckets, bolts, hand wheels, etc., illustrations, listing prices and complete specifications on all items shown.

M. H. Detrick Co., of Chicago, have issued a handsome catalogue, describing and illustrating a number of typical modern furnace settings to the success of which Detrick arches have been a contributing element of first importance.

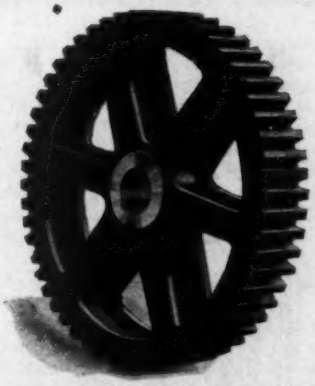
The story of Detrick installations is told, as far as possible, by drawings and photographs. Just the simple facts are given and the story of broad experience reaching into every phase of furnace and arch design must be read between the lines. The catalogue is worthy of a place in any engineer's library.

The S. F. Bowser & Co., Inc., of Fort Wayne, Ind., who, early in the summer, it was reported were suffering from financial reverses, have recently made a floatation of 10-year mortgage bonds, with sinking fund clause, amounting to $2,200,000. Every indication now points to a happy and unruffled continuance of the plans and policies which have made Bowser an important factor in the pump and tank industry and, indirectly, in many other lines of endeavor.

We are informed that a big paper mill will be built at Texas City, Texas, in the near future to manufacture paper out of bagasse.

Robins Conveying Systems
FOR HANDLING BULK MATERIALS
Write for Handbook of Conveyor Practice
ROBINS CONVEYING BELT COMPANY
New York Chicago Pittsburgh Boston

GEARS
All kinds—types and sizes
16,000 different patterns



MADE BY IMPROVED MACHINE MOULDING METHOD.
A SKILLED ORGANIZATION OF 81 YEARS' EXPERIENCE.
A GEAR SERVICE UNEQUALLED.
Catalog?
Poole Engineering & Machine Co.
Gear Makers Since 1843
Baltimore Maryland

RUST CAN'T GET A FOOTHOLD

RUST hasn't a chance on equipment, buildings and other steel surfaces that are painted with BITUMASTIC SOLUTION. This specially made protective paint finds and fills every microscopic pin hole, presenting a hard, brilliant coating that seals the surface against attacking elements. It not only defies rust but also withstands weather conditions, moisture, chemical fumes and high temperatures.

BITUMASTIC SOLUTION has and retains for a long period a lustrous finish which adds to the appearance of plant and equipment. When you apply BITUMASTIC SOLUTION you get protection, durability, economy and fine finish which are demanded in the modern paper mill.

A test will convince you. Write for Sample Can

SINCE **BITUMASTIC** 1854

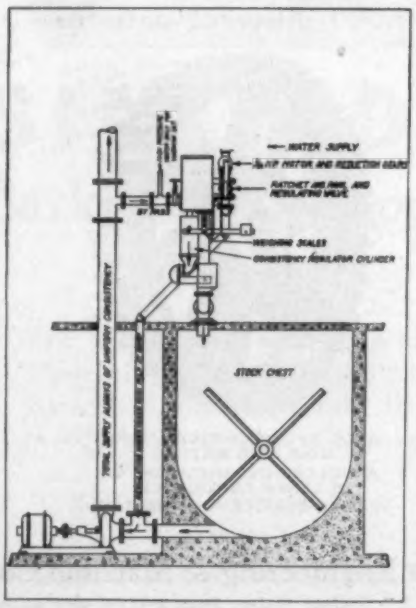
WAILES DOVE-HERMISTON CORPORATION

17 BATTERY PLACE, NEW YORK

322 S. Delaware Ave., Philadelphia Union Trust Building, Cleveland

The Trimbey Automatic Consistency Regulator

(Patented)



Not only the FIRST but the ONLY device on the market which will control the Consistency of Paper Stock as it is being pumped.

Acts as a continuous Sampler and by adding water at the pump controls the entire volume being handled.

345 of these machines are now in use in the United States, Canada, Newfoundland and in seven Foreign Countries.

Made by

Trimbey Machine Works

Glens Falls **New York**

(Also "Made in Canada")

Technical Developments in the Paper Industry

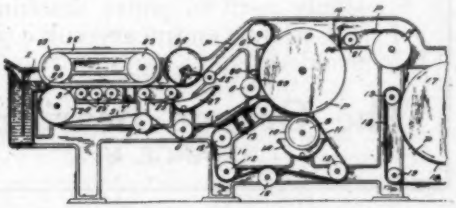
Domestic and Foreign

The following abstracts are of the latest developments found in the foreign press and the domestic and foreign patent offices. Photostats and translations of complete articles and patents can be obtained at cost price.

Paper Making Machine for Thin Papers

A UNITED STATES Patent No. 1,514,556 has been issued on a paper making machine, which is seen in the accompanying illustration and which is particularly adapted for the manufacture of tissue and thin papers.

The machine consists of a combination of a pair of engaging press rolls. An endless wire screen is provided on which the paper web is formed, and this wire is arranged so as to support the paper and to carry it into direct contact with a portion of the surface of the press roll. Means are also available for removing the moisture from the moist paper web that is formed in the usual manner, as the web passes over the wire and before it reaches the press roll. A blast of air is directed through the screen at the point where its contact with the upper press roll ends and this air is used for the purpose of causing the paper to adhere to the upper press roll. An endless press felt is also provided around the lower press roll, and means are also available for extracting the moisture from this endless press felt, prior to its passing through the bite of the press rolls. A paper carrying roll is placed in proximity to the upper press roll at the opposite side from the endless wire screen for guiding it to the dryer mechanism of the machine.



Purifying Pulp

IN BRITISH Patent of recent issue, pulp is refined by being delivered to a centrifugal machine of the type seen in the accompanying illustration. The pulp enters the centrifuge through the slide (7) and the action of centrifuging serves to collect the heavier impurities in the pulp at the side (3). These are retained there by the flange (10). The lighter impurities are retained by a ring (11) of greater diameter than the inner edge of the flange (10). The purified pulp flows between the flange (10) and the ring (11) to a stationary receiver (12) and from there to the paper making machine. Coloring matter and fillers may be mixed with the pulp in the apparatus. By regulating the flow of pulp to the apparatus, the thickness of paper formed on the paper machine may be adjusted.

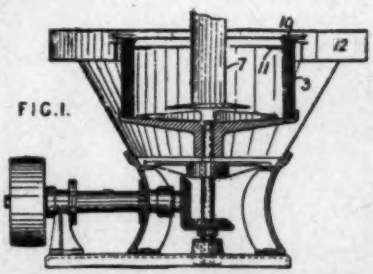


FIG. I.

Physical Chemistry of Wood Pulp Digestion

EXPERIMENTS were carried out on the digestion of wood sawdust with caustic soda and with sodium sulphide and sodium sulphate liquors showed that the progress of the digestion process can be calculated satisfactorily by the formulae that are used for unimolecular reactions. The velocity of the reaction is proportional to the concentration of the digestion liquor, and the influence of the temperature corresponds closely with the formula which has been established for ordinary reactions of this order. The reaction velocity for the dissolving of the incrustating matters is 148 degrees C., about 28 times as great as for the cellulose, but at a temperature of 170 degrees C. it is only about 8.7 times as fast. At about 270 degrees C. the velocity of the attack on the incrustating matter would be equal to that on the cellulose. The reaction constant for both reactions decreases somewhat as the digestion progresses. The velocity of the reaction on the incrustating matter is slightly greater in the case of sulphide liquors and sulphate liquors than in the case of plain sodium hydroxide of equivalent strength. The velocity of attack on the cellulose, however, is very much reduced by the use of sulphide or sulphate liquors. Hence the cellulose obtained by the latter processes is very much purer and of higher quality than that prepared with plain sodium hydroxide. Zellstoff und Papier, 1924, 182-4.

Watermarking Paper and Cardboard

THE OBJECT of the invention, which is patented in British Patent No. 215,302, is to provide an improved process for water marking while in a pasty condition, as in a paper making machine, paper, cardboard, and other products with a cellulose base, and with this object in view the invention consists in the use of a roller having the desired pattern engraved thereon in intaglio by the well-known photogravure process.

Heretofore it has been customary to use dandy rolls, dies or the like having the desired pattern in relief. By the process according to this invention, intricate designs and patterns can be artistically reproduced as water marks, the rollers employed being similar to those that are used in rotary printing machines.

The design is imprinted on the cylinders in the usual manner by a photographic process, and then the copper cylinder is subjected to the action of nitric acid so that after the operation and after washing, the image or design will be reproduced in all its details sunk into the cylinder in intaglio. The cylinder which is then well washed and freed from grease is then mounted on a mandrel and placed upon a paper machine, between the outlet of the wet part of the machine and the commencement of the drying part. The paper in a pasty condition is pressed by a pressing roller upon the copper cylinder. The latter imparts its design to the paper in the form of a watermark. It is claimed that this process is applicable to vat made paper, to cardboard, and to all products which are made with a cellulose base.

Removing Ink from Paper

GERMAN Patent No. 401,145 is concerned with a process for removing printing ink from old newsprint in the course of working it up into paper and paper board stock. According to this invention the removal of the ink from the paper is accomplished in a very complete manner, which takes but little time, by treating the printed paper with solvents that are free from water or which will not mix with water. Pyridine and piperidine have been found to be suitable solvents for this purpose.

For example, during the process of comminution of the paper or after it has taken place, pyridine is added and the amount of the solvent used is such that the entire mass of paper is covered with it. The pyridine immediately dissolves the oily constituents and binding agents in the ink and absorbs the coloring matter. The solution is then drawn off

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Self-Contained, Direct-Connected

for pumping size in mills from storage tank to machine.

All parts are interchangeable. This size pump will last a lifetime on ordinary work.

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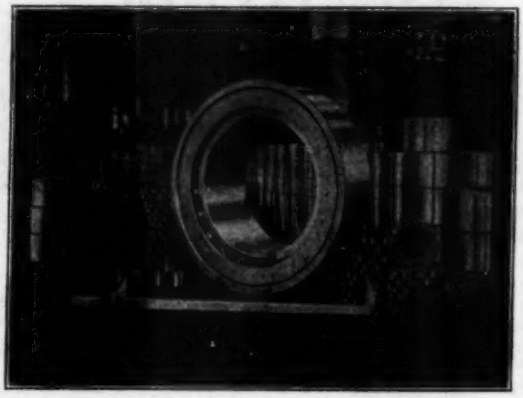

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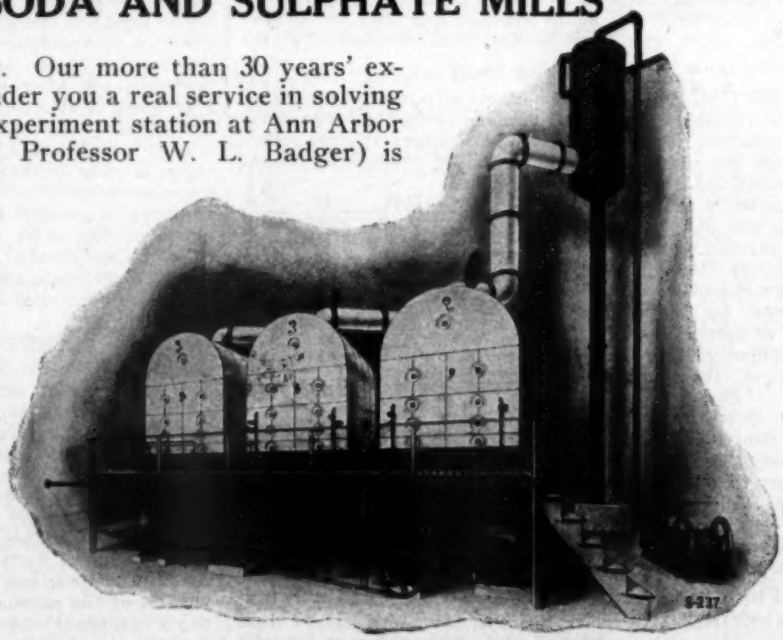


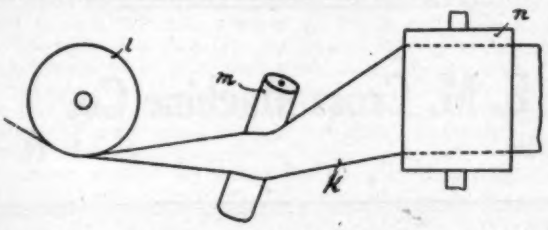
Standard Swenson Horizontal Tube, Triple Effect

and replaced by fresh pyridine until the solvent that is obtained from the solution tanks is perfectly colorless. This then indicates that all of the pigment has been removed from the paper fibers. The pyridine solutions that are obtained in this manner may be used over again, if they are kept separate and used in the same order as before. This practice may be carried out until the pyridine becomes saturated with the black pigment of the printing ink, and then it is possible to purify it by a simple distillation process. Thereafter, it can be used in the process just as if it were fresh solvent.

The paper mass that is obtained in this process is finally freed from the pyridine that adheres to it either by pressing, or by centrifuging, or by some other similar method. The feature of the process is that the pyridine is recovered almost in its entirety and the paper mass that is obtained may be used for the manufacture of paper.

Cylinder Drier for Paper Web

IN THE common forms of steam heated cylinder driers, which are employed in the manufacture of paper, the paper web is lead over and under the series of cylinders which are arranged horizontally. In this manner, the wet paper web comes in contact only with a small section of the surface of the drying cylinders. The transmission of the heat from the interior of the cylinder, produced by the condensation of steam, through the hot metallic surface to the wet paper web is affected unfavorably by the accumulation of condensate in the lower part of the drying cylinder and by the formation of



air cushions in the space that exists over the surface of the condensed water. A de-hydrating and de-aeration action through the hollow shaft of the drying cylinder is possible to a slight extent only.

In order to get around these difficulties, it was attempted to use drying cylinders with a vertical shaft. This arrangement has, however, been found to be useless, as the web of paper or of pulp in the wet condition did not possess enough strength and solidity to make it possible to convey it from one vertical cylinder to the next.

As may be seen in the accompanying sketch, the new type of drying cylinder which is patented in German Patent No. 396,370, has overcome this difficulty. This apparatus represents a combination of a horizontal drying cylinder (1), which performed a preliminary drying action on the paper web (k), and a vertical drying cylinder (n) which finished the drying of the paper web. The paper web was carried from the vertical to the horizontal cylinder and its direction changed by means of the guide roller (m). This sort of an arrangement of vertical and horizontal cylinders represents certain important advantages from the thermal standpoint, as it is possible to limit the number of horizontal cylinders to just such a number as will give a paper web of the required strength, so that it can be made to travel around the vertical drying cylinder and be completely dried.

The difficulty that the lower part of the paper web dries more slowly than the upper part of the web when it comes in contact with the stationary vertical drying cylinder, is remedied by the use of intermediate drying cylinders which are heated in part only, or by the use of a drying cylinder whose thickness of wall varies.

Chemically Active Paper

CHEMICALLY active papers, of the kind that are employed for pharmaceutical purposes, are made in accordance with the process which is patented in German Patent No. 397,364. In this process, pharmaceutical papers which are impregnated with nitre or the like are improved by the addition of small quantities of gum arabic, glue, or other adhesive to the solution employed in saturating the paper. When the papers are dried, the deposited salt adheres well to them. Furthermore, if a dried paper previously saturated with potassium bisulphite solution containing gum arabic is treated with acetic acid, the evolution of sulphur dioxide is slower than from a paper not containing the gum. This increases the value of such papers for disinfecting purposes.

Paper Sizing Composition

IN UNITED STATES Patent No. 1,512,212, there is described a sizing composition for use on paper which consists of a colloidal solution of aluminum resinate. This colloidal solution of aluminum resinate is made by dissolving a rosin soap in a protective colloid, dissolving the aluminum sulphate in a similar protective colloid and mixing the two solutions together.

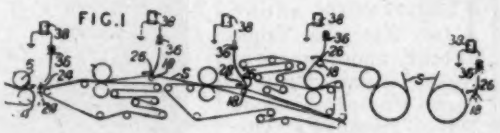
In United States Patent No. 1,512,213, there is also described a paper sizing composition which consists of five parts of rosin size, approximately five parts of alum and approximately ninety parts of a starch product.

Vegetable Parchment Paper

VEGETABLE parchment paper, which is an imitation of the real animal parchment, is generally made from properly selected paper stock, which is first manufactured into a paper and then subjected to the action of sulphuric acid, which parchmentizes the paper. An improved parchmentized paper in described in a British patent which consists in the application of ethylene glycol to a paper that has been treated with sulphuric acid. Both glycol and ethylene glycol are employed for this purpose with the idea of keeping the paper soft and pliable for a long period. Ethylene glycol is a dihydric alcohol, possessing properties quite similar to those of glycerine, which render it especially suitable for use in the form of a thin coating on vegetable parchment. It is used in the proportion of two hundred pounds to each ton of paper, and is applied in a uniform coating over one or both sides of the parchmentized paper. The parchment can then be rolled up in the form of rolls or stored in the form of sheets and does not become brittle by excessive drying out. In place of simple glycol or ethylene glycol, diethylene glycol may be employed.

Indicating Moisture in Paper Web

THE MOISTURE variation in a web of paper at one or more points during the course of its travel through the paper making machine is indicated by the variation in the



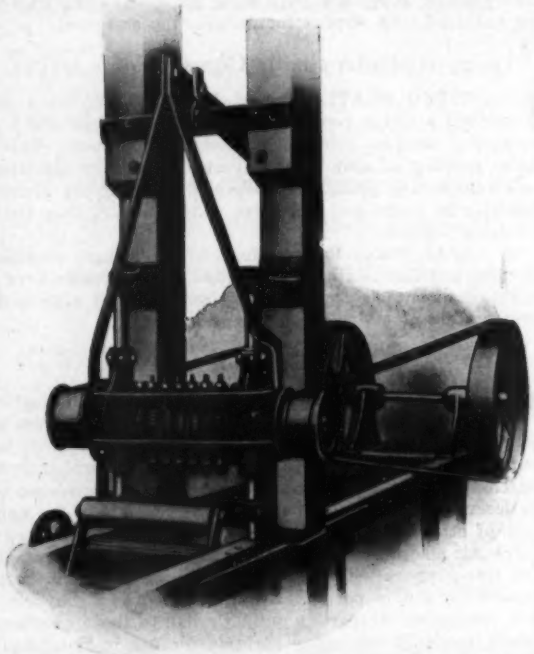
deflection of a galvanometer 38 (See Fig. 1), which, with the paper web (S) is in the circuit of an electrical battery (36). The apparatus may be used as indicated between the successive units of the paper making machine after the web leaves the couch rolls (6), (4), the rolls (24), (18) being metallic guide rolls and insulated from the machine. Means are provided for traversing the roll (26) across the machine to determine whether the moisture content varies from one side of the machine to the other. Where high speed paper machines are used for making thin paper, the upper electrode may consist of a narrow metal band (54), Fig. 3, running on two rolls held apart by a spring (60).

Manufacture of Sulphite Cellulose

IT HAS been shown that it is possible to save considerable time and heat in the operation of the sulphite digestion process when the sulphite digestion liquor is heated prior to its introduction into the digester. According to the present invention the source of heat that is employed for this purpose

Twelve Spindle Boring Machine

FOR BLOWPIT BOTTOMS



THIS machine was especially designed for boring planks for bottoms of blow pits. It bores straight or taper holes up to $\frac{7}{8}$" diameter, 1" apart each way. Will bore plank 11" wide, 18' long, with holes 1" apart, in 20 minutes. We furnish machine with guides ready to attach to wood work.

E. M. Cross Machine Co.

Berlin N. H.

ZAREMBA EVAPORATORS

ILLUSTRATION shows two Zaremba Triple Effect Evaporators in the West Virginia Pulp & Paper Company's Soda Mill at Tyrone, Pa. One Triple was installed in 1911, the other in 1916.

Zaremba Quadruple Effect Evaporator having capacity double that of the Triples shown was installed 1920.

Exhaust steam is used throughout.

MORE than fifty large Zaremba Multiple Effect Evaporators have been furnished to soda and sulphate pulp mills.

Zaremba Evaporators are also used for concentrating sulphite waste liquor—both acid and neutralized.

Consultation invited on new projects or where existing evaporators lack capacity or cause loss of soda.

REPEAT ORDERS ARE PROOF OF MERIT

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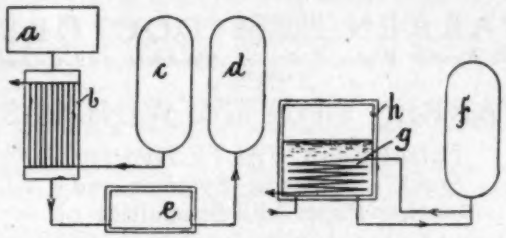
is the heat that is contained in the sulphite waste liquors as they leave the digester. Inasmuch as the quantity of the waste liquor is only about half of that of the fresh digestion liquor, there is also used, for this purpose of preliminary heating of the fresh liquor, the heat, that is contained in the



waste liquors derived from the alcohol plant which may be a part of the sulphite recovery installation. These waste liquors flow away from the alcohol distilling tower at a temperature of approximately 100 degrees C. For effecting the heating of the fresh digestion liquor a heat interchanging apparatus is employed, and when necessary certain auxiliary storage tanks are employed as well.

The apparatus that is used in the patented process is shown in the accompanying illustration. The cold fresh sulphite liquor is contained in the feed tank (a), and from this tank it is made to flow through the preheater (b), while the hot waste sulphite liquor from the digester (c) is made to pass through the same apparatus. The heated fresh liquor is then allowed to flow into the digester (d), or in case this is not ready to be filled with fresh liquor, the hot liquor is stored until ready for use in a properly insulated tank so that the heat is not lost. This tank is shown at (e). The preheater (b) and the storage tank (e) must be constructed in order to withstand the pressure in the liquor.

Another method of heating up the cold fresh digestion liquor is shown at the right of the illustration. In this case, the heating device is arranged within the insulated tank that is employed for holding the liquor after it has been raised to the required temperature. The hot liquor from the digester (f) is made to pass through the coil (g) which is placed in the sulphite cellulose waste liquor container (h) and in this way the heat in the hot liquor is transferred to the cold liquor. As in the previous case, the sulphite liquor container and the rest of the apparatus must be so constructed as to withstand the pressures that exist in the waste liquor and the apparatus must also be properly insulated. In order that the heat transference be accomplished at as high an efficiency as possible it is necessary that the coil within the tank be entirely covered with the cold liquor.

Wood Pulp Substitute

THE STRAW from cereal crops, maize, or the like, or reed stems, reed spikes, rushes or similar plants, or wood, jute, manila, hemp, bamboo, flax, or like material is finely divided and heated under pressure with a solution containing an alkali or alkaline earth sulphite, and a weakly acid salt, such as an alkali or alkaline earth bicarbonate. No sulphur dioxide is liberated in the process. Either half stuff or paper pulp can be obtained in this manner. German Patent No. 397,927.

Ink from Sulphite Waste Liquor

A BASIS composition for the preparation of printing and like inks consists of waste sulphite cellulose liquor, a resin such as ordinary rosin, or a mixture of the liquor and resin, neutralized or rendered alkaline by adding lime or other alkaline earth oxide, and preferably also an alkali such as soda ash. A small proportion of an insoluble meallic salt or oxide resistant to water and to atmospheric influences, such as zinc oxide or copper oxide, may also be added.

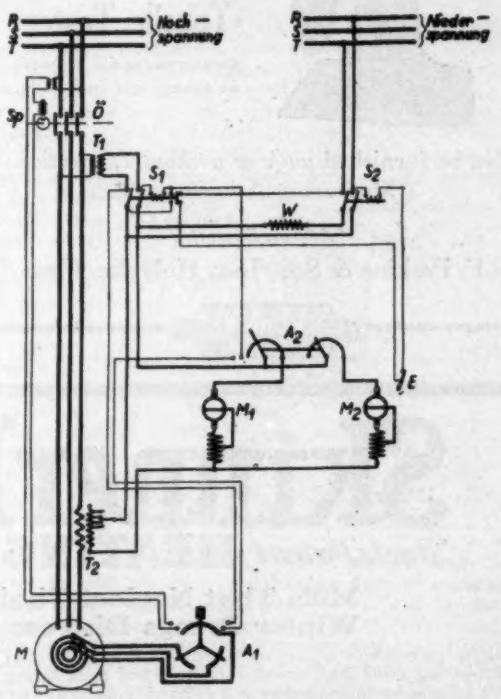
The sulphite cellulose waste liquor is heated to a temperature of 100 degrees C., the lime, etc., are added together or separately with continuous stirring, and then the mixture is de-odorized by prolonged heating at about a temperature of 200 degrees C., or by blowing with air at a temperature of about 100 degrees C. The resin is added to the liquor in the melted state. According to requirements as a printing ink oil or as a lithographic varnish, the product is incorporated with a light mineral oil, such as spindle oil, or with a vegetable oil, such as linseed oil.

For further details see British Patent No. 215,824.

Electrical Operation of Wood Grinders

THE OBJECT of the new improvement in the operation of wood grinders is to run these apparatuses with the aid of electric motors and provide means for pressing the logs of wood against the surface of the grindstones, the action being carried out by means of motors as well, without the necessity of having to provide special regulating apparatus for this purpose. The operation of the grinder is carried out in such a fashion that the load on the driving motor remains as constant as possible and that the pressure exerted cn the wooden logs in the various presses does not vary.

The figure shows the connections that are necessary in carrying out this invention. The driving motor is shown at (M), which is generally an alternating current, asynchronous

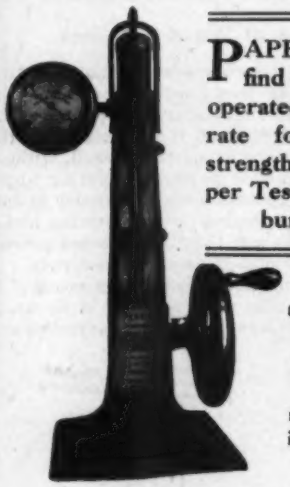


motor, or synchronous motor, wound for high voltage, and a grinder is connected with both ends of the shaft of this motor. The drive of the chain conveyor is accomplished by means of a single phase motor for each grinder. These motors, which are seen at (M_1) and (M_2), are connected in parallel and are fed in common from two single phase transformers, which are located on the line of the grinder motor, and through a voltage transformer and a current transformer as well, the connections being made in differential.

By means of this connection when the load varies on the grinder motor, variations take place in the overall voltage in such a fashion that as the load on the grinder motor rises the motors (M_1) and (M_2) are fed with decreasing voltage current, so that the speed of rotation of these motors decreases, and because of the reduction in the pressure, which is exerted against the blocks of wood in contact with the grindstone, the load on the grinder motor is reduced as well.

In the reverse order when the load on the grinder motor is too small, the total voltage across the transformer rises, and therewith the speed of the motors (M_1) and (M_2) is increased. This results in a corresponding increase in the pressure that is exerted against the ends of the blocks of wood in contact with the grinding surface with the result that the load on the grinder motor is simultaneously increased.

The Perkins Tensile Tester



PAPER makers and users find this efficient, simply-operated machine as accurate for measuring *pull* strength as the Mullen Paper Tester is for measuring bursting strength.

The Perkins Tensile Tester

measures tensile strength in pounds per inch strip.

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Skinner Bros.
Baetz Patent HEATING SYSTEM

Mills That Neglect Their Heating Winter Brings Distress Annually

Along comes winter, answers the roll call, year after year, with unfailing regularity, blanketing mills with snow, rain, cold and penetrating winds. Workers suffer, machinery fails to perform, orders are delayed, sometimes never filled, yet operating expenses go on with ceaseless energy and evidence of misdirected effort is apparent everywhere. In the final analysis, when investigations are complete, the cause can be definitely attached to unsatisfactory heating equipment.

Subdue Winter, Protect Your Help, Save Money

Skinner Heaters are individual compact units, constructed in the floor type and the inverted type for overhead suspension. They are effective because of their scientific, simple construction. No outside pipes or ducts are used for air distribution. Fan operated by any power available. Use live or exhaust steam at high or low pressure. They are portable and can be moved from one place to another by common labor. Completely assembled before shipment. Easy to install, most economical to operate and the maintenance cost is exceptionally low. Performance is positively guaranteed when installed as directed by our engineers.

Skinner Heaters Are Used by These Well Known Mills

Crocker-Burbank Co., Certainteed Products Corp., International Paper Co., Mt. Vernon Strawboard Co., Terre Haute Paper Co., American Paper Products Co., Fairfield Paper Co., New York and Pennsylvania Co., Castanea Paper Co., Dresden Paper Co., J. Strange Paper Co., Auglaize Box Co., Adams Paper Co., Bulls Mfg. Co., United Paperboard Company—Installations in 12 branch mills.

Skinner Bros Baetz Patent Heater Steam Coil Type S. C. uses live or exhaust steam at any pressure. Where steam is not available we furnish Skinner Bros Patented Direct-Fired Type D. F., which burns coal, coke, wood, gas or oil.

Our trained staff of experts will advise, without obligation with Executives, Engineers, Superintendents and Managers concerning heating, ventilating and air conditioning systems for mills, factories, plants and buildings of every type and size.

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Eastern Office and Factory, 116 Bayway, Elizabeth, N. J.
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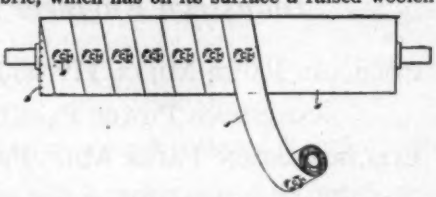
Hence in the process which has just been described the pressure of the wood against the grinding surface in both grinders is maintained at a uniform point and when a change does occur it takes place simultaneously in both.

In addition to this uniform regulation of the two motors (M_1) and (M_2) by alteration of the voltage of the current fed to them, the speed of these motors must change, independently in each case, according to the pressure that is being exerted against the blocks of wood in each grinder. This must be an automatic action. In order to attain this condition, the two motors (M_1) and (M_2) are connected in such a manner that the field is strengthened as the load increases and weakened as the load decreases. In the first case, there will be a decrease in the speed of the motor and in the pressure exerted against the grinding surface, and in the second case the speed of rotation will be increased and the pressure likewise.

This method of control is patented in German Patent No. 401,655.

Watermarking Paper

THE PROCESS of watermarking paper, which is patented in United States Patent No. 1,514,238, uses a roll on which a peripheral covering is wound as seen in the illustration. This peripheral covering consists of a strip of woven and felted woolen fabric, which has on its surface a raised woolen watermark design. This design is repeated at the proper intervals on this strip of woolen material, so that when the strip is wound around the roll, the watermark designs are located in the proper and desired position with respect to each other.



Tester for Boards

A BRITISH invention relates to a process and an apparatus for the testing of the strength of paper boards. It refers particularly to an attachment whereby a bursting strength tester can be used for the determination of the crushing strength of a single ply or multiple ply corrugated paper board. A plate is provided with a central opening which registers with the diaphragm covered opening of the "pop" tester. A movable jaw rests on the plate and has a depending central stem which fits into the opening of the plate with a minimum amount of friction, the length of the stem being greater than the maximum thickness of the stock to be tested. Above the jaw is a presser foot or clamp against which the jaw crushes the stock. The clamp is of the same area as the jaw and is preferably composed of an outer annular portion with a removable center filler piece, which can be taken out when making bursting strength tests. The diameter of the jaw and the clamp are sufficiently large that the crushed stock can be subsequently used for making a "pop" test on the same tester.

Treating Paper Pulp in the Colloid Mill

THE COLLOID mill is used in treating paper pulp in various ways. The processes are described in German Patents Nos. 396,676 and 396,677.

In the first patent, the pulp is worked in a colloid mill until a portion is transformed into a gel which acts as a size. The necessity of adding a separate sizing agent is avoided in this way. If a small amount of a hydroxide or a carbonate of an alkali or alkaline earth metal is added, the power consumed in rotating the mill is diminished. During the operation an inert gas, such as air or carbon dioxide, may be passed through the mill. The resulting pulp produces a paper of great tensile strength.

The second patent is concerned with a process for preparing an airproof, waterproof or fireproof paper, or paper board possessing any special qualities. In this process the usual saturating materials are added directly or in solution to the pulp and the whole is worked in a colloid mill. For example, a suitable oil, preferably dissolved in a low boiling point solvent, such as carbon tetrachloride, is added to the pulp and the mixture is worked in a colloid mill for a period of one to two minutes. In this manner, it is possible to obtain a pulp which is suitable for the manufacture of waterproof paper. Or else a solution of silicate of soda is added to the pulp; then it is mixed with dilute hydrochloric acid and the whole is milled, yielding a pulp which is uniformly impregnated with silica.

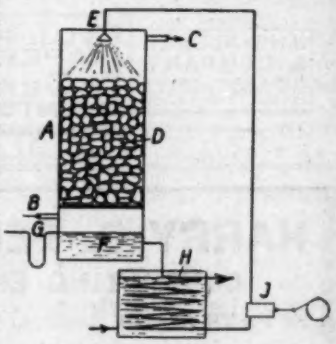
Coating Material

A COATING material, which is suitable for use in many applications, is made in accordance with United States Patent No. 1,514,226 by mixing paper material with loading and glue materials. The mixture is then ground until the fibers of the paper are thoroughly disintegrated. This finely ground mass is then diluted and beaten up to form a scum. The scum is condensed and is then ready for use. Any material that fails to turn into scum is returned for retreatment.

Cooling Burner Gases in Making Sulphite Liquor

GERMAN Patent No. 401,419 is concerned with an apparatus and process for cooling of the burner gases in the manufacture of sulphite liquor. The apparatus used for this purpose is seen in the accompanying illustration.

The washing tower (A), into which the burner gases are allowed to enter at the point (B) and to leave at the point (C), is filled with a tower packing (D). The spraying device is seen at (E). The wash liquor which at the beginning of the process is water runs into the lower part of the tower, seen at (F). From that point, it is made to flow through a cooler (H), and then is elevated by means of the pump (J) to the upper part of the tower, where it is sprayed down by means of the spray device (E). The original excess water, which is contained in the gases and which is precipitated in the tower (A) is then allowed to flow off through the siphon (G).



The new process possesses the advantage over the old process in the fact that considerably smaller apparatus is required for the cooling of the gases and also in the fact that it is possible to cool these gases more effectively and more safely down to the desired temperature without suffering any external temperature influences. It is said that this new process may be employed not only in the cooling of sulphur burner gases but also in cooling the gases derived from the furnaces in which pyrites is roasted.

Surface Sizing of Paper with Agar-Agar

AN INTERESTING short note has appeared in the German paper, Chemiker Zeitung, 1924, page 777, on the use of agar-agar or Carraghen moss for the surface sizing of paper in the place of gelatine products. Carraghen moss is a product which is odorless and tasteless. Its gelatinous properties are greater than those of gelatine and it is free from nitrogen.

The dried moss is washed with water and then heated for an hour on a water bath in the proportion of one part of the moss to 45 to 50 parts of water. The solution is filtered through a fine cloth and sugar is added to the filtrate in the proportion of one to one. The mixture is then evaporated to a jelly. The addition of salicylic acid or boric acid will preserve the jell. For use in sizing paper, ozone is allowed to pass through the jell to bleach it. After drying, the product is insoluble in cold water but soluble in hot water.

The sizing mixture contains 50 grams of the moss, the same amount of sugar, 850 grams of water and 50 grams of talc. Two hundred grams of the size is used for a two sided coating on one square meter of paper.

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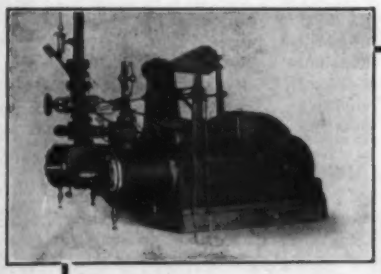

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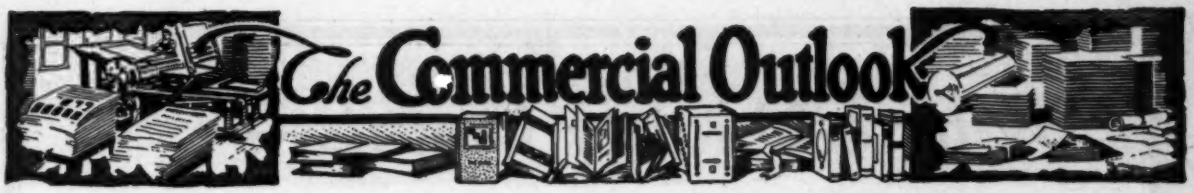

New York, December 1, 1924.

THE NATIONAL election on November 4 appeared to be the signal for the start of better and bigger business in paper. Almost the day following the election, the paper stock market took on an improved complexion. Demand increased to a very pronounced degree and from that time on steady broadening of trade activity in practically all kinds of paper has been noted, while the general condition of the industry has exhibited considerable improvement.

Of course, no such relative condition has developed in the paper market as has been observed in the securities market since election. The growth in demand for paper has been quite orderly and of very healthy character. Buyers have increased the number and volume of their orders because they have been in greater need of paper. General business has become so stimulated by the results of the election that paper, along with various other commodities, is moving into consuming channels in larger quantity; jobbers and consumers are less hesitant about placing orders with mills, and, the other way around, manufacturers of paper are less cautious in booking orders, all of which is leading to marked expansion in business.

Reports tell of mills in various parts of the country speeding up production to fill the larger influx of orders. It is gratifying that the reports state few manufacturers are increasing their output other than to cover actual commitments in hand; in other words, there is no wild orgy of production, no piling up of stocks in anticipation of an abnormal demand for paper, but mill owners are carefully gauging their manufacturing operations by the actual demand made on them for supplies. If anything, it is asserted, mill stocks of paper have been decreased instead of augmented during the last month because quite a few shipments have been made from stock. Moreover, not much buying is being done by consumers or jobbers for stocking-up purposes. There is more willingness manifested to buy ahead to some extent since jobbers feel there is every reason to expect a good steady demand from customers and no reason to believe paper prices will be any lower for some time than they are now, and since consumers can see potential requirements increase as activity in their own lines expands and since they feel they will save by doing a little ordering ahead now. Most of the paper in movement from mills is going almost direct into consumption. One only has to look around to see that paper consumption is decidedly on the rise, and the increased demand that has developed is nothing more than a reflection of the greater activity in the various paper consuming trades.

The outlook is bright indeed. No longer need business men fear the consequences of any political move in the United States; that is, not for the next four years. The conservative Government has been given a vote of confidence by the American public, and the political influence on business during the next several years should be helpful, not harmful. Manufacturers and merchants can proceed with their plants for extending business without worrying about Government interference, and this, coupled with the fact that conditions in Europe—political and financial—are so vastly improved, seems to foreshadow a period of wonderful business for the United States. Bankers and economists predict it, the stock market barometers it, and manufacturers and merchants appear to be well on the road toward pushing it and realizing it.

Prices of paper of nearly all kinds have firmed in tone. Not many changes have been noted, but the undertone is a good deal steadier; there is less disposition on the part of the mills to grant price concessions, jobbers have acquired the feeling that prices have been at the bottom, and that the next movement probably will be upward, and therefore are holding for full quoted rates from customers, while consumers also appear to appreciate the stronger price tone and are more willing to meet the quotations named. If raw materials keep on prevailing levels of cost, there is little doubt that paper prices will score some rather sharp advances in the near future. Rags and other raw materials have been rising at a rapid clip; the manufacturing cost of paper is substantially higher than it was only a short while ago, and it stands to reason manufacturers will be obliged to mark up prices of the finished product unless they are able to produce cheaper, particularly with demand increasing in a way where they will have ample support of the market in a price-elevating movement.

Paper production in the United States declined slightly during September compared with August, according to the monthly statistical summary of the American Paper and Pulp Association and affiliated organizations. Mills of the country produced a total of 434,000 net tons of paper of all kinds in September, against 442,654 tons in August, and 400,756 tons in July. Mill stocks of paper of all kinds at the end of September amounted to 236,397 tons, contrasted with 243,097 tons at the end of August, showing that manufacturers shipped out all of their current production in September. Shipments from mills totaled 439,630 tons in September, against 449,634 tons in the preceding month.

The monthly report on the boxboard industry compiled by the Department of Commerce, put the production of board of all kinds in the United States in September at 179,982 tons, showing a slight decline from the 186,340 tons produced in August. Board mills of the country operated a total of 7,715,528 inch hours during September, against 8,156,758 inch hours in August, while orders received in September called for 158,671 tons of board, against 202,542 tons in August, and unfilled orders on hand at the end of September aggregated 99,101 tons of board, compared with 118,492 tons at the end of August.

Newsprint is moving into consuming channels in large volume. As an instance, the Canadian Weekly Trade Review points out that stocks of print paper on hand in Canadian mills at the end of October were equal to only a little over two days' supply, which means manufacturers are shipping out paper so fast they are unable to accumulate stocks. Publishers all over the country are printing big issues; in New York, it is nothing uncommon to witness issues of morning papers of 44 and 48 pages on weekdays and afternoon papers of 60 pages and more. Contracting for 1925 deliveries of newsprint is proceeding and reports say that most publishers are materially increasing the tonnage of orders.

Fine papers are in good demand and prices are firm and tending upward. Book paper is enjoying a livelier market. Printers and publishers are buying in increased volume, and it is reported most book mills are well sold for some time ahead. Wrapping and tissue have moved in much larger amounts in recent weeks, due in part to retail merchants laying in supplies for the pre-holiday shopping season. Prices are steadier than have been recorded in quite a while. Building papers are wanted in exceptionally large tonnage for this period of the year, and prices have advanced. Box boards are fairly active and are at least holding their own in price after dipping lower early in November.

An examination for junior technologist will be held throughout the country on January 7, 1925. It is to fill vacancies in the Bureau of Standards, at an entrance salary of $1,860 a year. Advancement in pay may be made without change in assignment up to $2,400 a year.

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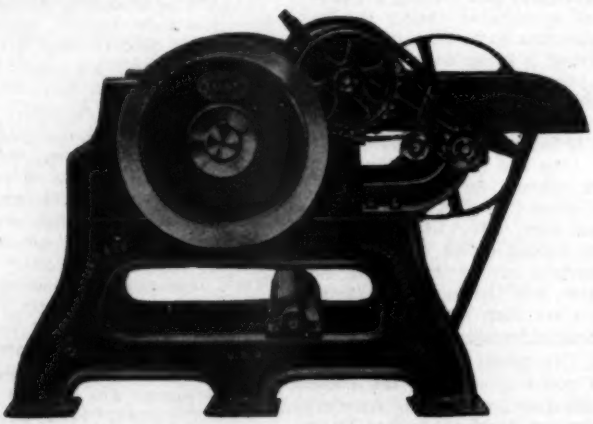

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Domestic Raw Materials

Papermaking Rags

Demand for papermaking rags has broadened and the market condition has firmed to a pronounced degree. The situation in rag stock, in fact, is characterized by a strong undertone. There are indications that available supplies of most grades of rags consumed by paper mills are not up to normal, that in spite of the high prices prevailing collectors are failing to locate usual quantities in country districts and in the large cities, and that stocks in Europe, on which paper manufacturers in the United States have drawn heavily in recent months, have been reduced to a really dangerous level.

The outstanding feature during November was the sharp advance in prices of roofing rags. Values of such rags jumped rapidly during a period of a fortnight and market levels were carried up higher than have been observed at any time since the war era. Significant, indeed, was the rise in roofing stock prices. Roofing rags are the lowest quality of rags used in the manufacture of paper, and obviously are collected in larger volume than any other grades. The fact that such rags advanced so rapidly and to such heights reflects the scarcity even of the bulk grades of rags as well as nearly all other qualities of papermaking rags. The sudden and big rise in roofing stock may be duplicated in any other description of papermaking rags, dealers contend, at any time demand from consuming quarters arises in sufficient volume to emphasize the limited available supplies at present. Moreover, it is the contention of dealers and importers that it will require considerable time before stocks in this country and in Europe can be accumulated to a level where any extra demand at all from paper mills would fail to have almost immediate influence in running values upward since the movement of rags to consuming plants in recent months has been of such heavy tonnage as to practically deplete the holdings of dealers and packers here and abroad.

Importers assert that, try as they may, they are unsuccessful in acquiring usual amounts of rags in Europe. Dealers on the other side of the Atlantic are said to be carrying little or no stocks and to be well sold up ahead, particularly on the lower qualities of papermaking rags as are used by roofing felt mills. Offers from foreign shippers are declared to seldom exceed 20 to 30 tons of any grade, where as ordinarily offers involve lots of 50 to 100 tons. A good many New York importers have representatives in Europe going through the different countries on the Continent looking for rags and buying on the spot, and it is stated that even in these cases it is impossible to get normal supplies.

Paper manufacturers generally are of the opinion that the high prices now obtaining for rags will stimulate collections and will soon result in larger supplies. This is somewhat problematical. Dealers point out that prices have been high for some time, that as a matter of fact, market values have been comparatively high all this year, which should have proved ample inducement to collectors to gather all the supplies to be had. On the other hand, it is an axiom in the rag trade that high prices bring out material, and it is probable incoming supplies will increase if values remain on prevailing levels long enough to cause collectors to double their efforts to locate rags.

Sales of No. 1 roofing rags have been made at as much as 3.25 cents per pound f. o. b. New York, and of No. 2 packing at 3 cents New York. It is said that even higher prices than these have been recorded in the Middle West, where the quality of packing is superior to that in the East. Foreign dark cottons have been sold at 3.20 cents a pound ex dock New York, and foreign linsey garments at 3.35 cents. The market for roofing rags quieted down a little toward the end of November, and in some instances prices raised a matter of a couple of dollars per ton, but the undertone continued very firm and there appeared little probability of any appreciable recession in market values.

New cuttings of all kinds are in a strong price position. Production of new rags has been small owing to the curtailed operations of clothing factories during most of this year, and dealers consequently have limited stocks of cuttings. With general business on the mend, however, this situation should soon show improvement as reports tell of the clothing production increasing. Dealers quote 16 cents a pound or higher f. o. b. New York for No. 1 white shirt cuttings and 10.50 cents for fancy shirt cuttings, while washables are priced at 9.25 cents and more, unbleached muslins at 14.50 cents, light silesias at 11.50 cents, blue overall cuttings at 11.50 cents, and light flannelettes at 12.50 cents.

Old white rags have firmed up slightly in value, due in part to a better demand from consumers and in part to the strengthening influence of the advance in roofing stock. Dealers quote 7:50 to 8 cents a pound at shipping points for No. 1 repacked whites, 5 to 5.50 cents for No. 2 repacked, and 3.75 to 4 cents for street soiled white rags. Thirds and blues are quotably higher at 4.25 to 4.50 cents for repacked and 3.75 cents for rough blues.

Average quotations f. o. b. shipping points and ex dock New York are as follows:

New Stock—	New York and Chicago
White shirt cuttings, No. 1	16.00-16.50
White shirt cuttings, No. 2	11.00-11.50
Fancy shirt cuttings	10.25-10.50
Washables, No. 1	9.25- 9.50
Unbleached muslins	14.25-14.75
White lawns	13.50-14.00
Overall cuttings, blue	11.25-11.50
Black silesias	6.25- 6.50
Light flannelettes	12.25-12.50
Canton flannels, bleached	13.50-13.75
Canton flannels, unbleached	12.25-12.50
Shoe cuttings, bleached	12.50-13.00
Shoe cuttings, unbleached	11.00-11.50
Light silesias	11.25-11.50
O. D. khaki cuttings	6.75- 7.00
Mixed khaki cuttings	6.00- 6.50
Corduroy cuttings	6.00- 6.25
Cottonade cuttings	5.25- 5.50
Linens, No. 1 white, foreign	17.00-18.00
Light prints, foreign	9.00- 9.50
Old stock—	
Whites, No. 1, repacked	7.50- 8.00
Whites, No. 2, repacked	5.00- 5.50
Whites, house soiled	4.00- 4.25
Whites, street soiled	3.75- 4.00
Lace curtains	5.50- 6.00
Thirds and blues, rough	3.50- 3.75
Thirds and blues, repacked	4.25- 4.50
Black stockings	4.50- 4.75
Cotton canvas, No. 1	5.75- 6.25
White cotton batting	4.75- 5.00
Roofing, No. 1	3.10- 3.25
Roofing, No. 2	2.85- 3.00
Dark colored cottons, foreign	3.00- 3.20
Blue linens, foreign	6.00- 6.50
Gray linens, foreign	6.50- 7.00
White linens, foreign	11.00-12.00
Light prints, extra, foreign	5.25- 5.50

CROWN FILLER

THE SOLVAY PROCESS COMPANY announces that, on and after January 1, 1925, sales of Crown Filler to the paper trade will be made direct through its Sales Department, Wing & Evans, Inc.

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Rope and Bagging

Felt paper manufacturers as a general rule consume fair-sized quantities of old bagging, which they mix in with rag stock. When prices of rags are high a larger proportion of bagging is utilized; therefore when the rag market scored a sharp advance a few weeks ago demand for bagging from felt paper mills increased to such a degree that in short order bagging was following rags right on up in value. Market levels now are higher than they have been all year; in fact, they are higher probably than have been recorded since the war period. Roofing bagging is bringing 2 cents a pound and higher f. o. b. dealers' shipping points, while No. 1 bagging is quoted at 2.60 cents and sometimes higher. Few dealers, it is stated, are sorting bagging, finding it more profitable to ship all the stock coming in as roofing bagging, with the result not much No. 1 bagging is on the market. Gunny has sold at 3 cents and higher per pound f. o. b. or ex dock New York.

Old rope is firm in price and in good demand. Dealers assert that they are not getting normal supplies of rope, either from domestic or foreign sources, yet there is apparently enough supply to satisfy the wants of consumers. The element of scarcity, however, is holding prices very steady, and No. 1 old domestic manila rope is selling at 7 cents a pound at dealers' shipping points, and foreign No. 1 rope at 6.50 to 6.75 cents ex dock New York. Strings are moving in a consistent way at maintained prices.

F. o. b. shipping point and ex dock New York quotations follow:

	New York and Chicago
Gunny, No. 1, domestic	3.00-3.15
Gunny, No. 1 foreign	2.90-3.00
Scrap bagging, No. 1	2.60-2.75
Roofing bagging	2.00 2.15
Wool tares, heavy	2.70-2.80
Wool tares, light	2.60-2.70
Manila rope, No. 1, foreign	6.50-6.75
Manila rope, No. 1, domestic	6.75-7.00
Sisal strings	2.25-2.50
Mixed strings	1.40-1.60

Old Paper

For quite a lengthy period old paper stayed down in the dolrums of market dullness, with demand from consuming quarters developing slowly and in light volume and with prices on comparatively low levels, while rag stock was advancing literally by leaps and bounds under the stimulus of a very active market. Now, it would seem, old paper is commencing to have its innings. At any rate, there is a better buying interest, demand has increased a little for nearly all grades, and prices have improved their position at least to some extent. Dealers say collections are down to a minimum, that stocks are far below normal tonnage, and that all that is required for values to undergo considerable enhancement is for consumers to enlarge their buying just a bit more.

Quoted prices in the Middle West are somewhat beyond those prevailing in the East, as they frequently are, this being largely a matter of quality of packing as well as western mills buying in heavier tonnage when they buy. Shavings are quoted from 3.65 to 3.85 cents a pound f. o. b. dealers' shipping points for No. 1 hard white shavings, and at 3 to 3.25 cents for No. 1 soft white shavings. Ledger stock is selling at 1.60 to 1.80 cents per pound at shipping points, No. 1 heavy books at 1.35 to 1.50 cents, No. 1 old Kraft paper in compressed bales at 1.90 to 2 cents, and white news cuttings at 2 to 2.15 cents. Folded newspapers are bringing 85 to 95 cents a hundred pounds f. o. b. New York and Chicago, and No. 1 mixed paper 65 to 75 cents.

Quotations f. o. b. shipping points are as follows:

	New York and Chicago
Hard white shavings, No. 1	3.65-3.85
Hard white shavings, No. 2	3.20-3.40
Soft white shavings	3.00-3.25
Colored shavings	1.50-1.75
Heavy book, No. 1	1.35-1.50
Crumpled book, No. 1	1.10-1.20

JOSEPH GATTI President and Treasurer

GATTI Paper Stock Corporation

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The easiest way to survive competition is to reduce the cost of production.

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Eighteen reasons why you should use "Michigan" combination steel and wood pipe

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"Steel for Strength—Wood for Durability"

Ledger stock	1.60-1.80
Kraft, No. 1	1.90-2.00
Manilas, No. 1	.85- .95
White blank news	2.00-2.15
Over-issue news, No. 1	1.00-1.10
Folded news	.85- .95
Mill wrappings	.75- .85
Mixed paper, No. 1	.65- .75
Common paper	.45- 55

Chemical Pulp

Chemical pulp is in fair demand. There is little or no excitement in the market as consumers are ordering needed supplies in conservative fashion and as available supplies seem fully ample to cover all the wants of consumers. At the same time, the market undertone appears to be slightly firmer. Very little or no change has occurred in quoted prices but producers are more confident in their attitude, there is less disposition to shade asked prices, while the feeling exists that any change in pulp values over the winter will doubtless be in an upward direction. Domestic manufacturers continue to complain of foreign competition. Pulps are being sold by European producers at prices which it is hard for producers in the United States to meet profitably, and it can be said that less than normal amounts of domestic pulp is being sold in the open market, although a good many manufacturers are producing in fair volume against their own requirements.

Quotations on bleached sulphite range from 3.75 to 4.25 cents per pound f. o. b. pulp plants for No. 1 sulphite, while easy bleaching sulphite is selling at 2.75 to 3 cents at pulp mills, and news grade sulphite at around 2.60 cents. Bleached soda pulp is quoted at 3.50 cents at producing points, and No. 1 Kraft at 2.75 to 3 cents.

The output of chemical pulp in the United States during September reached a total of 89,900 net tons of all grades, compared with 88,513 tons in August and 84,950 tons in July, according to the monthly report of the American Paper and Pulp Association in co-operation with the U. S. Pulp Producers' Association. Mill stocks of chemical pulp at the end of September were 24,444 tons, against 25,722 tons at the end of the preceding month.

F. o. b. pulp mill quotations are as follows:

Bleached sulphite	3.75-4.25
Easy bleaching sulphite	2.85-3.10
Unbleached sulphite, No. 1	2.60-2.85
News grade sulphite	2.50-2.75
Soda pulp, bleached	3.50-3.75
Mitscherlich, unbleached	3.25-3.75
Kraft, No. 1	2.75-3.00
Screenings, refined	1.50-1.75

Mechanical Pulp

Ground wood seems to be gradually working into a stronger market position. Demand at present is reported nothing extraordinary, yet it is stated that a ready sale exists for practically all the supply that is reaching the market, and that low water in mill streams has so handicapped some grinders that production has fallen below normal and that consequently stocks at mills are on the downslide rather than increasing. Transient buyers are absorbing ground wood in rather consistent fashion, and, of course, the fact that certain producers have been unable to run their plants on a full scale has brought additional buyers into evidence who have taken up about all the supply to be had not alone for prompt shipment but also for delivery over the next several months. Another strengthening factor is the high cost of Scandinavian ground wood. Importers state they must secure close to $40 a ton ex dock New York or other American Atlantic ports for ground wood brought in from Europe to be able to import the commodity at a profit, and this price is so far above a parity with domestic market levels here that not much foreign ground wood is coming into the country.

Domestic grinders quote around $32 a ton f. o. b. pulp mills for prime spruce ground wood; the full price range being from about $30 up to $35, depending on the air-dry

(*Continued on page 1657*)

Starch

A SIMPLE change in the manufacturing process often results in a pronounced decrease in cost of production.

Paper Mills use Starch for sizing to produce better and stronger sheets with lower cost of manufacture.

Our SPECIAL PAPER brand for beater-sizing increases strength of sheet and gives improved finish.

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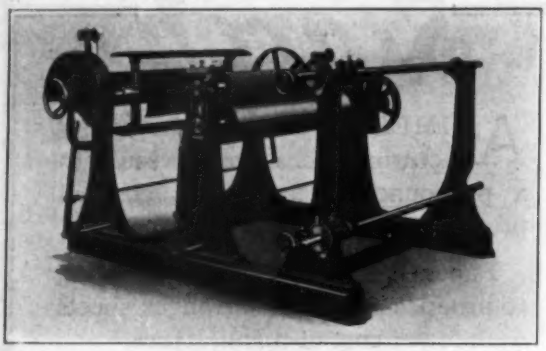

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IN ORDER to get the most satisfactory results from any collapsing reel it is necessary that the reel runs at the same speed as the pull or delivery rolls. To accomplish this we equip reels with Independent Variable Speed Transmission, which enables the operator to quickly adjust the speed of the Reel to speed of paper coming from pull or delivery rolls, regardless of whether Reel is entirely or partially collapsed.

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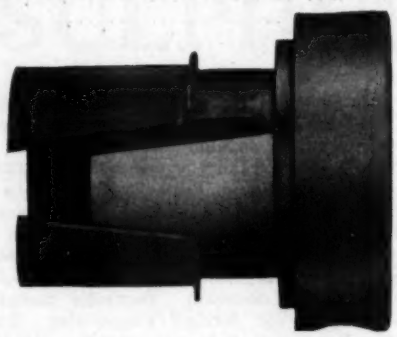
THE ONEIDA CHUCK for use with Paper or Strawboard Cores



This chuck is so designed that it cannot split or damage the paper core on which the paper is wound and allows the roll to be run down to the last thickness of paper.

The conical or wedge-shaped chucks now commonly used with paper cores invariably split the paper cores so that from ½" to 1" of paper next to the core is damaged. The elimination of this waste will soon pay for the equipment on each machine.

Our Chuck allows the use of a cheap non-returnable paper core that once used can be thrown with the waste and sold.

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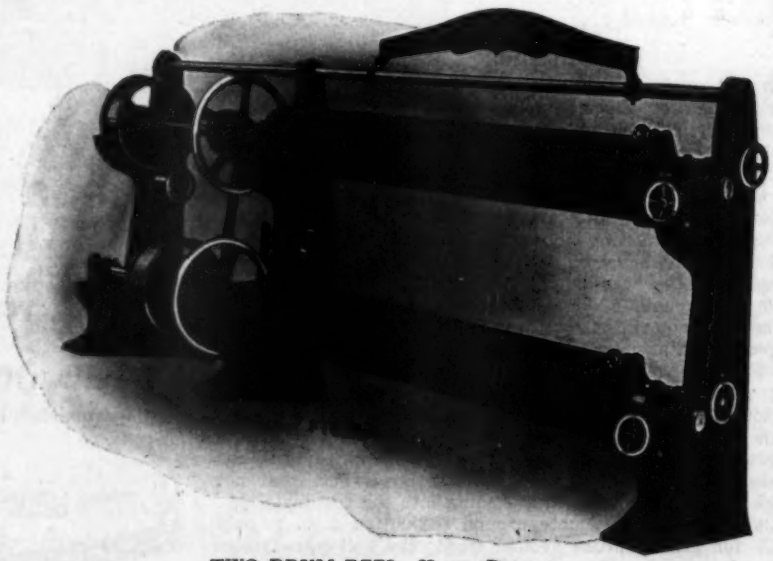

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New Papers

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White rag	20-45
White sulphite	11-30
Colored rag	16-40
Ledger—	
White rag	20-50
White sulphite	13-30
Colored sulphite	40-30
Colored rag	16-50
Bonds—	
White rag	19-45
White sulphite	10-30
Colored sulphite	10-30
Colored rag	16-50
Book—	
No. 1 S. & S. C.	6.75- 7.50
Machine finished	6.50- 7.25
English finished	6.75- 7.50
Coated and enameled	8.50-14.00
Lithographed, M. F.	9.00-15.00
Newsprint—	
Rolls, contract	3.50-.....
Rolls, transient	3.65-.....
Sheets	4.00- 4.25
Side runs	3.00- 3.25
Cover Stock—	
Coated, both sides	10.25
Coated, one side	10.15
Tissue—	
No. 1 white, 20x30	.75- .85
No. 2 white, 24x36	.70- .75
No. 1 manila, 24x36	.70- .75
Kraft	.90- 1.00
Wrapping—	
No. 1 Kraft	5.75- 6.50
No. 2 Kraft	5.00- 5.50
Boards—	New York and Chicago
Solid news	45.00-50.00
Straw	45.00-50.00
Plain chip	40.00-45.00
White coated chip	60.00-65.00
Manila coated chip	55.00-60.00
Binder's board	70.00-75.00

Mechanical Pulp

(*Continued from page* 1655)

test and the freight to consuming centers. Canadian quotations are from $30 a ton upwards f. o. b. producing plants.

Production of ground wood in the United States dropped from 75,751 tons in August to 72,532 tons in September, while mill stocks totaled only 130,377 tons at the end of September, contrasted with 141,917 tons at the end of August, the statistical report of the American Paper and Pulp Association and the U. S. Pulp Producers' Association shows.

Chemicals

A fair movement of most papermaking chemicals is reported. Contract buyers are absorbing all the supply coming in to them on back orders and are frequently engaging in some spot buying. Prices are mostly steady with those on some commodities showing an upward tendency. Casein is quoted at 10 cents or slightly higher, caustic soda at 3.10 cents, soda ash at 1.38 cents, and bleaching powder at 1.90 to 2 cents.

Average quotations f. o. b. works are as follows:

Alum, lump ammonia	3.25- 3.50
Alum, lump starch	3.75- 4.00
Blanc fixe, powdered	3.75- 4.00
Bleaching powder	1.90- 2.00
Brimstone (long ton, at mine)	17.00-20.00
Casein (duty paid)	10.00-11.00
Caustic soda, spot delivery	3.10- 3.20
China clay, domestic washed	12.00-15.00
China clay, foreign	15.00-20.00
Rosin, grade E	6.00
Satin white	2.00- 2.25
Soda ash, 58 per cent light (bags)	1.38
Starch, papermakers', in bags	3.40- 3.70
Talc (ton)	16.00-17.00

The World's Business

The second annual issue of the "Commerce Yearbook" has just been released by the Department of Commerce. Practically everything of interest about the business life of the nation and its foreign competitors and customers is covered.

The first issue covered the year 1922 and met with such widespread approval among industrial executives that it has been characterized as one of the most important services to business that has ever been made by any Government agency. The combined efforts of a large staff of trade experts in all parts of the world has made "Commerce Yearbook" an authentic reference of basic facts and a guide in problems of trade, production, price changes, and markets.

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Analysis of the machinery, railway equipment, textile, paper, leather, automotive, rubber, and chemical industries.

Thirty-five pages on fuel and power, covering the coal, petroleum, and electrical industries.

Full facts on construction industry, with essential statistics on building activity, output of materials, costs, etc.

A summary of the general trend of business throughout the year, with an outline of the basic factors that influenced trade.

Forty-three pages on domestic trade (including the year's statistics of sales, production, and unfilled orders), and on labor conditions (comprising employment, immigration, and wages).

Ninety pages on agricultural production, reviewing the cereal, cotton, sugar, tobacco, live stock, dairy products, and canned food trades.

Thirty-five pages on metals, including iron and steel, copper, lead, zinc, aluminum, and tin.

Statistics and explanatory text on the foreign trade of the U. S.

Reviews of the economic developments in the principal foreign countries.

Essential data on transportation and communication.

Fifteen pages devoted to wholesale and retail prices.

A comprehensive record of finance and banking.

The price of the book is 85 cents and may be secured from Julius Klein, Director, Bureau of Foreign and Domestic Commerce, Department of Commerce, Washington, D. C.

Mr. Stewart Bolling, Jr., and Mr. H. D. Andress, formerly representatives at Akron, Ohio, for Southwark Foundry & Machine Company, Philadelphia, Pa., are no longer connected with them. The Cleveland office and its territory is now in charge of Mr. F. H. Smith of the Philadelphia address.

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EXPORTS

Exports of paper from the United States in September, 1924, showed a slight decline in value from the preceding month and also a little drop from the shipments in September last year, according to statistics compiled and published by the Department of Commerce. Total exports of paper of all kinds in September last amounted in value to $1,952,044, compared with exports of a value of $2,182,882 in August last, and $2,014,834 in September last year.

Exports of newsprint in September last reached a total of 1,815,802 pounds, of a value of $97,008, contrasted with shipments totaling 2,388,067 pounds of a value of $112,953 in the same month a year ago. Book paper, not coated, exported in September last amounted to 2,157,093 pounds, valued at $222,270, against shipments of 2,010,098 of a value of $237,487 in September, 1923.

The United States exported wrapping paper, not including Kraft, totaling 1,886,837 pounds, valued at $140,360, in September last, against 1,991,467 pounds of a value of $161,624 in the same month a year ago, while exports of Kraft wrapping in September were 48,091 pounds of a value of $8,387, compared with 51,186 pounds of a value of $6,766 in September last year.

Paper board exports from the United States in September showed a gain over last year, totaling 5,768,827 pounds, valued at $188,514, compared with 4,811,107 pounds of a value of $217,386 exported in the corresponding month in 1923. Writing paper exports in September were 327,343 pounds of a value of $58,556, contrasted with 425,269 pounds of a value of $80,139 in the same month a year ago.

IMPORTS

Wood Pulp

According to a majority of factors in the trade, business of fair volume is transpiring in imported wood pulp. Paper and board manufacturers in quite a number of cases have been contracting for pulp on a rather large scale for forward shipment from Scandinavia; not only has demand been good for supplies for last open water shipment from abroad, but there has also been considerable buying for first open water shipment next spring and for later delivery in 1925.

The position of the pulp market is steady, indeed. If anything, there is an upward tendency in prices, yet no broad changes have been recorded during the last month in quotations on any grade of pulp. However, the tone is firm; producers in Europe are asking steady prices and are holding rather firmly for the rates asked, and practically all of the business done recently has been at fully maintained prices. Advices say that Scandinavian mills are well sold up not alone for the balance of this year, but also, in some cases, well into the new year. At the same time, there is no visible sign of any shortage of pulp. As a matter of fact most members of the trade are frank to say they do not look for any shortage to develop during the present winter, but they are of the opinion that the statistical position of supplies abroad and in the United States is such that prices will be held on at least prevailing levels for some months to come, and that if there is a movement of pulp prices during the winter it will be in an upward direction.

A strong factor in the situation, it is contended, is that mills in Sweden are entering the closed navigation season with practically no unsold stocks of pulp on hand. This will mean that the market will not experience any selling pressure from primary sources during the winter as manufacturers will doubtless utilize the period when the Baltic is frozen over to accumulate stocks against spring commitments. Reports are that a rather late season is anticipated in northern Europe this winter and that as a result the Baltic may remain open to navigation longer than usually, possibly until January, which will permit Swedish mills to ship out pulp up until the end of the year.

Pulp imports into the United States were on a heavy scale in September, according to Department of Commerce figures; in fact, they were larger in that month than in any month thus far this year. Imports of chemical pulp of all kinds totaled 118,379 tons, compared with 107,970 tons in August, 102,361 tons in July, and 110,932 tons in February, which month was marked by heavier pulp importations than any month in the year up to September. September imports brought the total for the first nine months of 1924 up to a total of 804,782 tons, showing a monthly average of 89,420 tons, compared with a monthly average of importations of 84,695 tons in the same period last year. Imports of mechanical pulp in September amounted to 21,899 tons, making a total for the first nine months of this year of 148,682 tons, an average of 16,520 tons per month, contrasted with an average of 20,613 tons monthly in the corresponding time of 1923.

Kraft pulp displays a very firm price tone. Sales of prime Swedish Kraft of standard quality have been made freely at 2.85 cents per pound ex dock New York, and some brands for papermaking instead of for board manufacture have brought up to 3 cents. Bleachd sulphite is quoted from a minimum of about 3.75 cents a pound ex dock New York up to 4.25 cents, depending on the quality, while strong unbleached sulphite of prime grade is selling at an average price of 2.75 cents on the dock at New York or other American Atlantic ports. Easy bleaching sulphite is quoted at 3 cents and higher and ordinary Mitscherlich unbleached of German origin at 2.60 cents ex dock New York. Foreign ground wood is quoted at $38 to $40 per ton on the dock at New York.

Receipts at the port of New York in November and current market quotations ex dock New York follow:

Bleached sulphite, No. 1	3.75- 4.25
Unbleached sulphite, strong, No. 1	2.65- 2.90
Unbleached sulphite, No. 2	2.50- 2.65
Easy bleaching sulphite	2.90- 3.15
Mitscherlich unbleached, genuine	2.85-3.25
Mitscherlich unbleached, ordinary	2.60- 2.75
Kraft, standard Swedish	2.80- 3.00
Grand wood, per ton	38.00-40.00

Perkins-Goodwin Co., 3,300 bls. from Drontheim and 145 from Christianla; Castle Overton, 385 bls. from Rotterdam and 2,535 from Hamburg; Hartig Pulp Co., 1,866 bls. from Rotterdam and 3,725 from Bremen; Bulkley, Dunton & Co., 5,125 bls. from Bremen; Lagerloef Trading Co., 3,025 bls. from Bremen; Industrial Fiber Co., 1,000 bls. from Gothenburg; J. Andersen & Co., 652 bls. from Hamburg; National City Bank, 2,794 bls. from Hamburg; Central Union Trust Co., 1,649 bls. from Hamburg and 6,765 from Sundsvall; Ira L. Beebe & Co., 8,924 bls. from Hamburg; Equitable Trust Co., 572 bls. from Hamburg and 1,250 from Gothenburg; E. M. Sergeant Co., 500 bls. from Sundsvall and 145 from Christiania; E. Naumberg & Co., 600 bls. from Sundsvall; Guaranty Trust Co., 3,000 bls. from Ohrirken and 1,500 from Sundsvall; Johaneson, Wales & Sparre, 3,780 bls. from Harnqsand and 1,000 from Iggesund; M. Gottesman & Co., 4,000 bls. from Trieste; E. J. Keller Co., 400 bls. from Hamburg; Buck,

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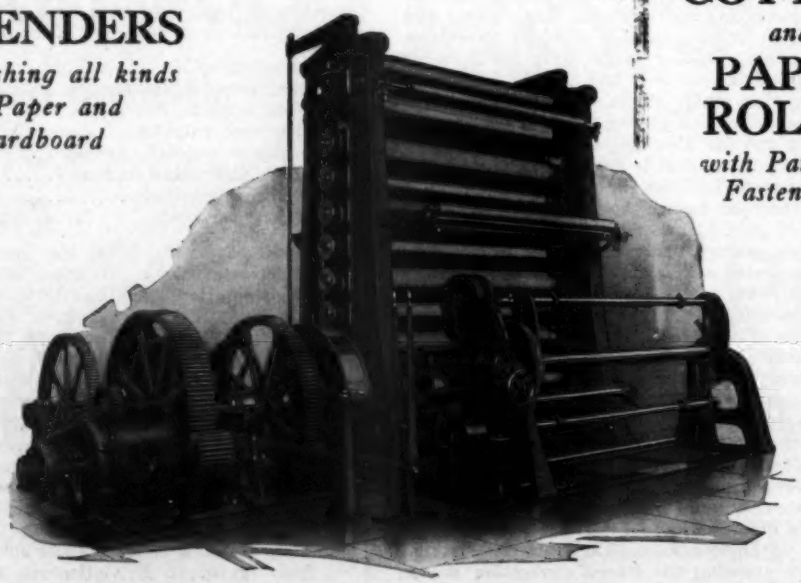

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Paper Stock

Probably the feature in importations of papermaking materials other than wood pulp at the port of New York in November was the large receipts of rag stock. Rags literally poured in from the various European countries, and the month's total of imports possibly was close to the record for a single month. Imports of old rope and bagging and miscellaneous paper stock were about normal. Receipts of all kinds of papermaking stock through the port of New York in November, with names of consignees, were as follows:

Old Rope

Brown Bros. & Co., 343 bls. and 246 coils from Rotterdam, 66 coils from Hamburg, 418 coils from Bristol, 238 bls. from Antwerp, 75 coils from Copenhagen, 153 coils and 9 bls. from Hull, 200 coils from Newcastle and 44 coils from Christiania; International Purchasing Co., 71 coils from Rotterdam; G. M. Graves Co., 96 bls. from London; United States Mortgage & Trust Co., 166 bls. and 8 coils from Bremen; E. J. Keller Co., 204 bls. from Rotterdam, 120 bls. from Trieste, 272 coils from Newcastle and 60 bls. from Copenhagen; Ellerman's Wilson Line, 95 coils from London; Stone Bros. Co., 112 coils from Hull; S. Birkenstein & Sons, 93 coils from Hull; Anglo-South American Trust Co., 472 coils from Genoa; W. Schall & Co., 420 coils from Genoa and 34 coils from Hamburg; North German Lloyd, 193 bls. from Bremen; Order, 120 coils from Glasgow, 37 bls. from Hamburg and 3 bls. from Santiago.

Old Bagging

E. Butterworth & Co., 67 bls. from Rotterdam and 106 from Leith; E. J. Keller Co., 516 bls. from Antwerp, 574 from Hamburg, 277 from Rotterdam and 193 from Copenhagen; Textile Waste Merchandising Co., 261 bls. from Antwerp; Brown Bros. & Co., 54 bls. from Antwerp; S. Birkenstein & Sons, 343 bls. from Rotterdam and 106 from Leith; British Bank of South America, 130 bls. from Manchester and 43 from Liverpool; Mechanics & Metals National Bank, 105 bls. from Manchester; Equitable Trust Co., 70 bls. from Manchester; Kidder-Peabody Acceptance Corp., 79 bls. from Havre; Castle & Overton, 28 bls. from Havre; Daniel M. Hicks, Inc., 61 bls. from Havre; Maurice O'Meara Co., 26 bls. from Rotterdam; Prince & Kennedy, 39 bls. from Dublin; Order, 47 bls. from Bremen, 34 from Manchester and 236 from Antwerp.

Rags

E. J. Keller Co., 2,891 bls. from Hamburg, 660 from Kobe, 1,880 from Copenhagen, 1,100 from Rotterdam, 135 from Alexandria, 290 from Algiers, 125 from Antwerp, 36 from Marseilles, 284 from St. Nazaire, 104 from Trieste, 254 from Bordeaux, 282 from Bremen and 12 from Dublin; Castle & Overton, 212 bls. from Antwerp, 207 from Rotterdam and 358 from Dunkirk; S. Birkenstein & Sons, 436 bls. from Antwerp, 365 from Rotterdam, 6 from Hull and 52 from Bordeaux; Stone Bros. Co., 44 bls. from Rotterdam, 910 from Hull, 24 from Glasgow, 191 from Havre, 13 from Liverpool and 367 from Copenhagen; J. J. Patricof, 150 bls. from Rotterdam; American Wool Stock Co., 195 bls. from Rotterdam; Textile Waste Merchandising Co., 423 bls. from Rotterdam; L. Sher & Sons, 167 bls. from Dunkirk and 473 from Havre; Robert Bishop Mfg. Co., 233 bls. from Dunkirk; M. Wolfer & Co., 32 bls. from Havana; Marquardt-Hewitt Corp., 212 bls. from Havre; P. Berlowitz, 634 bls. from Rotterdam, 50 from Marseilles, 394 from Antwerp and 16 from Hamburg; Atterbury & McKelvey, 185 bls. from Rotterdam; M. Frank

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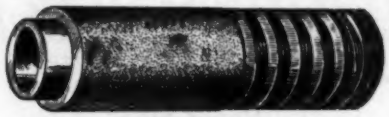

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Co., 48 bls. from Osaka; Whaling Waste Products Co., 148 bls. from Rotterdam, 93 from Dunkirk and 255 from Havre; I. Abela & Co., 92 bls. from Trieste; Albion Trading Co., 312 bls. from Bordeaux and 12 from London; Darmstadt, Scott & Courtney, 26 bls. from Havre; D. I. Murphy, 103 bls. from Dunkirk and 173 from Havre; Burmon & Bolonsky, 20 bls. from Dunkirk; Atlas Waste Mfg. Co., 33 bls. from Havre; Katzenstein & Keene, 24 bls. from Havre and 11 from Dublin; J. Palmieri, 104 bls. from Genoa; Maurice O'Meara Co., 46 bls. from Bremen; S. Shapiro & Sons, 48 bls. from Rotterdam; Bankers Trust Co., 136 bls. from Bremen, 31 from Leith and 30 from Liverpool; Chase National Bank, 136 bls. from Bremen; Garfield National Bank, 293 bls. from Bremen and 76 from Hamburg; National City Bank, 118 bls. from Bremen, 519 from Hamburg and 85 from Barcelona; Philadelphia National Bank, 267 bls. from Havre and 60 from Barcelona; Union National Bank of Philadelphia, 123 bls. from Hamburg; Coal & Iron National Bank, 45 bls. from Antwerp, 45 from Hamburg and 70 from Glasgow; Mechanics & Metals National Bank, 302 bls. from Antwerp; National Bank of Commerce, 165 bls. from Danzig, 103 from Manchester and 717 from Leghorn; International Acceptance Bank, 61 bls. from London and 379 from Hamburg; Anglo-South American Trust Co., 174 bls. from Leith, 61 from Liverpool and 100 from London; Banque Belge, 94 bls. from Hamburg; Chemical National Bank, 25 bls. from Rotterdam; Bank of New York & Trust Co., 40 bls. from Manchester; Irving Bank-Columbia Trust Co., 260 bls. from Constitantinople; State Bank, 24 bls. from Rotterdam; Atlantic Exchange Bank & Trust Co., 193 bls. from Bordeaux; Lincoln National Bank, 104 bls. from London; Equitable Trust Co., 135 bls. from Alexandria; East River National Bank, 129 bls. from Genoa; Baring Bros. & Co., 14 bls. from Havre; Amsinck, Sonne & Co., 198 bls. from Alexandria and 33 from Bordeaux; R. F. Downing & Co., 143 bls. from Manchester; Strupp & Co., 315 bls. from Hamburg; MacKenzie & Co., 13 bls. from Havre; Brown Bros. & Co., 576 bls. from Bremen, 89 from Glasgow, 132 from Belfast, 223 from Swansea, 17 from Manchester, 78 from Hamburg and 55 from Leith; A. W. Fenton, Inc., 447 bls. from Cardiff; Kidder-Peabody Acceptance Corp., 180 bls. from Antwerp; American Express Co., 42 bls. from Leith; Ladenburg, Thalman & Co., 82 bls. from Hamburg; Order, 35 bls. from Bremen, 42 from Rotterdam, 120 from Dundee, 543 from Constantinople, 376 from Manchester, 622 from London, 509 from Liverpool, 353 from Barcelona, 8 from Alexandria, 70 from Glasgow, 25 from Leith, 122 from Genoa and 13 from Copenhagen.

Miscellaneous Paper Stock

Andrew Ragone Co., 7 bls. from Bremen; S. Birkenstein & Sons, 36 bls. from Leith; Baring Bros. & Co., 32 bls. from Dundee and 47 from Dublin; Daniel M. Hicks, Inc., 38 bls. from Rotterdam and 100 from Dunkirk; Anglo-South American Trust Co., 17 bls. from Rotterdam, 81 from Venice and 160 from Glasgow; Maurice O'Meara Co., 115 bls. from Genoa and 42 from Antwerp; National City Bank, 4 bls. from Glasgow and 90 from Hamburg; C. R. Spence & Co., 58 bls. from Glasgow; Amsinck, Sonne & Co., 12 bls. from Glasgow; Coal & Iron National Bank, 30 bls. from Glasgow and 70 from Hamburg; Stone Bros. Co., 95 bls. from London; E. J. Keller Co., 147 bls. from Mannheim and 224 from Antwerp; Textile Trading Co., 56 bls. from Dunkirk; Whaling Waste Products Co., 78 bls. from Antwerp; British Bank of South America, 77 bls. from Liverpool and 144 from Manchester; Equitable Trust Co., 91 bls. from Antwerp and 95 from Barrow; Guaranty Trust Co., 35 bls. from Glasgow; Brown Bros. & Co., 121 bls. from Glasgow and 74 from Dublin; R. F. Downing & Co., 70 bls. from Manchester; Atterbury Bros., 165 bls. from Havre; Order, 294 bls. from Liverpool, 84 from Gothenburg and 662 from Hamburg.

Paper

Receipts of both wrapping and printing paper from abroad were on a fairly heavy scale, judging from the imports at the port of New York during November. The great bulk of paper imported through this port consisted of one or the other of these two classes of paper, and arrivals of both were somewhat larger than in the several previous months. Otherwise

WAUSAU SULPHATE FIBRE CO.
MOSINEE, WISCONSIN
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Cut down *excessive* wrapping paper investment. Why carry two wrapping paper lines for one wrapping paper *purpose?*

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presents a perfect wrapping paper, weight and strength for each wrapping purpose. Made in all weights from 15 pounds to 100 pounds basis. The one complete, standardized and economical line of wrapping paper sold.

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New Sand Filter

A SPECIAL filter for paper mills, producing all the results the paper manufacturer desires. It is a modification of the well known Hungerford filter adapted to paper mill use. It is constructed of concrete, strictly wrought iron pipe, brass strainers and especially prepared silica sand. It is as durable and efficient as can be built at any cost. It can be sold at a very low figure.

This filter gives perfectly clear water, washes thoroughly, does not require renewal of the sand bed, is absolutely reliable in the performance of its duty and requires a minimum amount of attention.

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Guaranteed Perfect
Draper Hollow Balanced Brass Balls
FOR STUFF PUMPS
Absolutely balanced; will not pound out of shape

Specify these when ordering new pumps.

Order these to replace worn-out balls.

We make a specialty of repairing stuff pump balls.

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Port Huron, Mich. Petrolea, Canada
Every ball bears our registered trade-mark

there appeared to be no feature in paper imports at New York in November. Receipts of cigarette, filter, writing, hanging and other grades were approximately normal. Importations of paper of all kinds through the port of New York in November follow, these data being taken from the manifests of steamers reaching this port during the month:

Printing

Henry Lindenmyer & Co., 66 cs.; Perry, Ryer & Co., 358 cs.; C. Steiner, 41 cs.; Keuffel & Esser Co., 3 cs.; Falsing Paper Co., 166 bls.; W. Schall & Co., 62 cs.; H. Hollesen, Inc., 220 rolls and 202 cs.; Equitable Trust Co., 194 rolls; B. F. Drakenfeld & Co., 71 cs.; Merchants Products Co., 8 bls.; P. C. Zuhlke, 20 cs.; Chemical National Bank, 52 rolls; Miller & Wright Paper Co., 3 cs.; Maurice O'Meara Co., 50 cs.; Perkins-Goodwin Co., 43 cs.; H. Aschpurwis, 63 rolls; J. P. Heffernan Paper Co., 484 rolls; Murphy Paper Co., 90 bls.; Bankers Trust Co., 166 rolls; C. G. Keferstein, 12 bls. and 8 cs.; Bank of New York & Trust Co., 424 rolls; Martin & Bechtold, 14 cs.; National City Bank, 192 bls.; Aronson Bros., 231 bls.; W. Hartmann & Co., 232 rolls; Norwegian Paper Mills Agency, 169 rolls; H. Reeve Angel & Co., 114 rolls; T. D. Downing & Co., 10 cs.; P. Puttmann, 110 cs.; Schenkers, Inc., 18 rolls and 11 cs.; Hudson Trading Co., 198 rolls and 30 bls.; International Acceptance Bank, 49 bls.; Oxford University Press, 5 cs.; Drinhausen & Hollkott Paper Co., 778 rolls; Order, 3,613 rolls, 224 bls. and 47 cs.

Wrapping

Maurice O'Meara Co., 474 rolls and 125 bls.; Wilkinson Bros. & Co., 491 bls., 9 rolls and 4 cs.; Chemical National Bank, 167 bls. and 2,525 rolls; National City Bank, 3,679 bls.; J. P. Heffernan Paper Co., 410 bls.; Bank of America, 50 bls.; E. Dietzgen & Co., 14 cs., 141 rolls and 9 bls.; C. K. MacAlpine & Co., 379 rolls and 155 bls.; Gilbert Paper Co., 172 bls. and 224 rolls; Charles F. Hubbs & Co., 169 rolls; Universal Paper Co., 59 bls. and 170 rolls; Borregaard Co., 215 bls. and 761 rolls; Mugler & Unlauff, 93 bls. and 52 rolls; Chatham & Phenix National Bank, 460 rolls; Republic Bag & Paper Co., 496 bls.; P. H. Petry & Co., 16 cs.; Equitable Trust Co., 65 bls.; Bernard, Judae & Co., 72 bls.; F. C. Strype, 14 cs. and 2 rolls; R. Lachmann & Co., 238 bls.; Arkell Safety Bag Co., 122 rolls; M. M. Cohen, 68 bls. and 115 rolls; Miller Paper Co., 326 rolls and 10 bls.; D. S. Walton & Co., 299 rolls and 22 bls.; Blauvelt-Wiley Paper Mfg. Co., 167 bls.; Lunham & Reeve, 2 cs.; Happel & McAvoy, 5 cs.; Irving Bank-Columbia Trust Co., 11 cs.; Order, 256 bls., 912 rolls and 3 cs.

Cigarette

Standard Products Corp., 238 cs.; P. J. Schweitzer, 134 cs.; Miguel, Costa & Miguel, 4 cs.; American Tobacco Co., 600 cs.; R. J. Reynolds Tobacco Co., 1,000 cs.; DeManduit Paper Corp., 233 cs.; Liggett & Myers Tobacco Co., 6 cs.; Kaufman Bros. & Bondy, 10 cs.; M. Spiegel & Sons, 8 cs.; Southern Pacific Co., 3 cs.; Irving Bank-Columbia Trust Co., 75 bls.; F. C. Strype, 17 cs.; F. P. Gaskell & Co., 20 cs.; Order, 21 cs.

Writing

Guibont, Freres & Co., 91 cs.; F. C. Strype, 22 cs.; J. W. Hampton, Jr., & Co., 34 cs.; Sternberg & Co., 32 cs.; Defiance Sales Corp., 18 cs.; D. C. Andrews & Co., 3 cs.

Drawing

E. Dietzgen & Co., 52 cs.; Keuffel & Esser Co., 83 cs.; H. Reeve Angel & Co., 3 cs.; Favor, Ruhl & Co., 7 cs.

Filter

E. Fougera & Co., 49 cs.; Garfield National Bank, 9 cs.; H. Reeve Angel & Co., 50 cs.; C. G. Euler, 33 bls.; A. Giese & Son, 48 bls.

Tissue

Iwai & Co., 8 cs.; Mitsui & Co., 5 cs.; Meadows, Wye & Co., 22 cs.; Baldwin Shipping Co., 4 cs.; G. W. Sheldon & Co., 24 cs.; Order, 2 cs.

Photo

Globe Shipping Co., 252 cs.; Gevaert Co. of America, 5 cs.; G. Gennert, 17 cs.; Corn Exchange National Bank of Philadelphia, 72 cs.; P. C. Zuhlke, 35 cs.; J. J. Gavin & Co., 4 cs.

MITTS & MERRILL

Conveyor or Gravity Feed Shredder

THE operation of a beater, with its wear and tear and tremendous power consumption, has one primary purpose, namely, hydration. Anything that will economically bring about hydration more quickly relieves the beater just that much, cuts down on operating costs and speeds the process of paper making.

The Mitts & Merrill Shredder performs on magazines, books, old paper and boxboard, frozen or dried pulp laps, roll and sheet stock, in such a way as to greatly reduce their resistance to hydration when they reach the beater. It gives the beater an economical lift.

Our Shredders are built in sizes with spouts ranging from 18" to 45" wide. We will be glad to quote you on any size adapted to your requirements.

We also build a 100% efficient "Hog" to reduce pulp mill bark and wood refuse.

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Paper Machinery For Sale

One Pusey & Jones Fourdrinier Part takes wire 126″ x 60′ equipped with New Century shake Millspauch suction couch roll and Connersville vacuum pump.

Moore & White four drum winders.

Two 72″ nine roll Holyoke super calenders.

Four 66″ nine roll Holyoke super calenders.

One 48″ nine roll Holyoke super calenders.

Four 60″ Hamblet sheet cutters with Moore & White layboys.

Two Jones beaters 66 x 57.

Complete Marshall Drive for Paper Machine —Pusey & Jones self-contained type with friction clutch, cone pulley and Mortise gear.

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WATERTUBE BOILERS

2—205 H. P. 180 lb. Heine A. S. M. E.
2—290 H. P. 200 lb. B&W A. S. M. E.
4—295 H. P. 160 lb. B&W A. S. M. E.
2—400 H. P. 180 lb. B&W A. S. M. E.
10—500 H. P. 160 lb. Parker A. S. M. E.
4—500 H. P. 200 lb. Heine A. S. M. E.
4—600 H. P. 175 lb. B&W A. S. M. E.

GENERATORS

1—200 K.V.A. Westinghouse, 3-60-480 Volts. Connected to a straight line automatic engine.

1—200 K.W. Crocker Wheeler, 3-60-220/440 Volts. Connected to a Compound Tandem Engine.

1—500 K.W. Westinghouse, 2-60-220 Volts. Connected to a Parsons Turbine.

1—500 K.W. Western Electric, 3-60-440 Volts. Connected to a Four Valve Corliss Engine.

Locomotive Cranes—Industrial Railway Equipment, Etc.

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Manufacturing Plant for Sale

A foundry and machine plant with pattern shop located in New England is offered for sale at a price of about one-half the replace value.
It is in actual operation producing pulp and paper mill machinery.
Reason for selling, lack of sufficient working capital.
Address, The Paper Industry, Box 70.

FOR SALE: Two Spangenburg Rotary Paper Screens with counter and pulleys. Used only few weeks. Plates .036 cut. Complete in every detail and good as new. Price $1,500 each f. o. b. Bastrop, which is half price. Bastrop Pulp & Paper Co., Bastrop, La.

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Expert, prompt and personal attention in patent and trademark matters. Inquiries solicited. Fourteen years' experience. Lester L. Sargent, Patent Lawyer, 524 Tenth St., N. W., Washington, D. C.

Steel Plate Construction
Steel Storage Tanks, Blast Furnaces, Gas Holders
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Steel Transmission Towers
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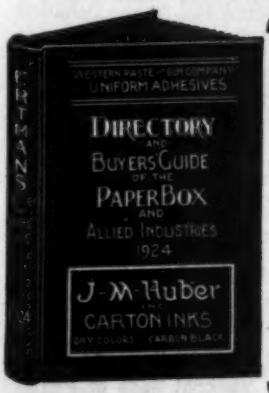
General Offices, Pittsburgh, Pa.

FOR SALE—One Paper Machine which can be seen in operation until the first of the year—and which is being replaced because of our need for larger capacity. This is a five cylinder machine with an 82″ trim having 55 42″ diameter horizontal dryers—a Farnham suction roll and a stack of calenders. This machine is in first-class operating condition.

If interested, write or visit us at 205 West Monroe Street, Chicago, United States Gypsum Company.



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A. C. Dodman, Jr., & Co., 251 bls.; F. J. Emmerich & Co., 111 bls.; W. H. S. Lloyd & Co., 9 cs. and 15 bls.; Drinhausen & Hollkott Paper Co., 2,710 rolls; H. Reeve Angel & Co., 178 rolls; C. A. Haynes & Co., 69 bls.; American Shipping Co., 25 bls.; J. W. Hampton, Jr., & Co., 1,685 bls.

Board

Adrian Vuyck, 1,247 rolls; C. B. Richard & Co., 3 cs.; A. Leunis, 16 cs.; M. Loft, Inc., 13 cs.; J. C. Robold & Co., 11 cs. and 14 bls.; P. C. Kuyper & Co., 35 cs.; Bendix Paper Co., 8 cs.; H. Hollesen, Inc., 117 bls.; P. H. Petry & Co., 11 cs.; F. G. Prager & Co., 19 cs. and 52 rolls; Coty, Inc., 50 cs.; F. C. Strype, 26 cs.; O. M. Baxter, Inc., 40 cs.

Miscellaneous

Whiting-Patterson Co., 83 cs.; Massee & Co., 4 bls.; Hensel, Bruckman & Lorbacher, 19 cs.; Japan Paper Co., 114 cs.; N. Stephenson, 28 cs.; Charles W. Williams & Co., 68 cs.; F. L. Kraemer & Co., 7 cs.; Schenkers, Inc., 18 cs.; H. W. Robinson & Co., 4 cs.; Bernard, Judae & Co., 3 cs.; P. H. Petry & Co., 25 cs.; Atlantic Forward Co., 3 cs.; Phoenix Shipping Co., 9 cs.; American Express Co., 2 cs. and 51 bls.; Morrison Machine Co., 22 cs.; Louis DeJonge Co., 7 cs.; Overton & Co., 6 cs.; B. C. Ritchie, 40 cs.; O. G. Hempstead & Sons, 4 cs.; Borden & Riley Paper Co., 8 cs.; Richardson Bros., 17 cs.; R. Wilson Corp., 38 cs.

Foreign Trade Opportunities

Additional information regarding the following foreign trade opportunties issued by the Bureau of Foreign and Domestic Commerce of the United States Department of Commerce may be obtained from the Bureau in Washington, D. C., or its branch offices. It is requested that the number of the inquiry be given at all times.

No. 12010—Paper. Recife, Brazil. Purchase and agency desired.

No. 12085—Paper and cardboard. Havana, Cuba. Agency desired.

No. 12087—Printing and paper trade machinery. Berlin, Germany. Purchase and agency desired.

No. 12086—Writing paper for legal documents, ordinary writing paper, and wrapping paper. Hamburg, Germany. Purchase desired.

No. 12082—Rosin for paper factories. Paris, France. Purchase desired.

No. 12169—Labels for tin and bottles. Bombay, India. Purchase desired.

No. 12175—Old newspapers, overissued. Bombay, India. Purchase and agency desired.

No. 12178—Paper, of various kinds. Bombay, India. Agency desired.

No. 12179—Sandpaper. Buenos Aires, Argentina. Agency desired.

No. 12163—Wood pulp, chemical (poplar, aspen and magnolia). Bordeaux, France. Purchase and agency desired.

No. 12168—Paper and pulp manufacturing machinery. Stockholm, Sweden. Exclusive agency desired.

No. 12168—Felts for papermaking machines. Stockholm, Sweden. Exclusive agency desired.

No. 12301—Wrapping paper, cheap grades. Port au Prince, Haiti. Agency desired.

No. 12302—Vulcanized paper for technical purposes. Stuttgart, Germany. Agency desired.

No. 12281—Paper, special grades. Hamburg, Germany. Agency desired.

Foote Bros. Gear & Machine Company, Chicago, are now erecting a new addition to their plant with an entrance on Lake street. The new building is to be used for shipping, receiving and raw material storage.

The West Side Bag and Paper Company has removed to new and larger quarters at 21 West 100th street, New York.

Speed up production with a crane

IT IS almost impossible to believe that there are paper mills today that are not equipped with some kind of a crane. How a mill can meet the constant demand for quantity production and service without a crane, is practically inconceivable.

Paper mill owners throughout the country are realizing this more and more each day, and many come to the conclusion that it can not be done.

How are you looking at the matter? Can you say that you are running your mill to capacity and making good profits by employing old methods of pulp wood handling? No one can. That is the reason for the great number of O-S DEPENDABLE Cranes that are sold every year.

You can not afford to let your competitor outsell you. You must have the volume of business in order to make money. An O-S crane will start you off. Write today for catalogs and interesting data.

ORTON & STEINBRENNER CO.
608 South Dearborn Street
CHICAGO

O-S DEPENDABLE

Globe and Cylinder Rotary Bleaching Boilers
Digesters
Riveted Steel Tanks
Flumes, Smokestacks, Penstocks, General Steel Plate Construction of every description

Where Satisfaction Is Sure

THE natural place to go for Rotary Bleaching Boilers, Digesters and other steel plate equipment is the source that has supplied these with complete satisfaction for years and years past.

A buyer can't go wrong that way. He knows that the equipment is made by people who know how and that it will be right in every particular. And the price must be right, in order to hold such a big volume of the business. Naturally, we are talking about Biggs, the headquarters for Rotaries and other steel plate equipment.

The Biggs Boiler Works Company
Seneca Place and Case Ave. Akron, Ohio
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The Biggs Boiler Works Co. Akron Ohio

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ROTARY BLEACHING BOILERS
for Years of Dependable Cooking and Bleaching

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IT is no longer necessary for dealers and industrial firms to install expensive railroad trestles in order to unload their coal economically. The Godfrey System has changed all this. It not only unloads the coal, but delivers it to the point of consumption, at a cost of from three to seven cents a ton. One man does all the work and he does it so quickly that demurrage charges are entirely eliminated. Investigate this time, labor and money-saving equipment today! Ask for a copy of Bulletin A-1.

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